AMERICAN VETERINARY REVIEW

EDITED BY

PROF. A. LIAUTARD, M.D., V.M.

Member Central Society of Veterinary Medicine (Paris). Honorary Fellow Royal College Veterinary Surgeons (England). Foreign Corresponding Member Academy of Medicine Bruxelles (Belgique),

AND

Prof. ROBERT W. ELLIS, D.V.S.

WITH THE COLLABORATION OF

Prof. W. J. COATES, M.D., D.V.S., New York-American Veterinary College.
OLAF SCHWARZKOPF, Veterinarian, 3d Cav., U. S. Army, Fort Sam Houston, Texas.
Prof. W. L. WILLIAMS, V.S., New York State Veterinary College, Ithaca, N. Y.
Prof. S. STEWART, Kansas City Veterinary College, Kansas City, Mo.
M. H. MCKILLIP, M.D., V.S., McKillip Veterinary College, Chicago, Ill.
B. F. KAUPP, M.S., D.V.S., Research Pathologist, Chicago, Ill.
Prof. M. H. REYNOLDS, University of Minnesota, St. Anthony Park, Minn.
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A. T. KINSLEY, M.Sc., D.V.S., Path. Kansas City Veterinary College, Kansas City, Mo.
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J. G. RUTHERFORD, V.S., H.A.R.C.V.S., Ex-Veterinary Director-General and Live Stock Commissioner, Ottawa, Canada.
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JOHN R. MOHLER, V.M.D., Pres. American Veterinary Medical Association, Washington, D. C.
L. A. MERILLAT, V.S., Chicago Veterinary College, Chicago, Ill.
D.E. SALMON, D.V.M., Ex-Director of the Veterinary School, Montevideo, Uruguay.
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A. D. MELVIN, M.D.C., Chief of B.A.I., Washington, D. C.
GEO. H. GLOVER, M. S., D. V M., Director Div. Vet. Sci., Colo. Agr. Coll., Ft Collins, Colo.
S. A. GRUENER, M.V.S., Veterinary Inspector, Kamtchatka, Russia.

And several others.

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AMERICAN VETERINARY REVIEW.

OCTOBER, 1912.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, August 15, 1912.

THERMOPRECIPITIN IN THE DIAGNOSIS OF BACTERIDIAN ANTHRAX.—Some short time ago we received from Adjunct Professor Pio Silva of the Institute of Internal Pathology, Hygiene, Sanitary Medicine and Meat Inspection of the Veterinary School of Modena, of which Dr. Frederico Boschetti is Director, the following *"Contribution to the Study of the Reaction of Ascoli"* (*Thermoprecipitin*) *in the diagnosis of Bacteridian anthrax.* Peculiar circumstances have prevented its publication before this. We regret the delay and hasten to repair it.

"The analysis of the numerous works published until today on '*Thermoprecipitin*' Ascoli and Valenti (1), Valenti (2), Bierbaumn (3), Pfeiler (4), Roncaglio (5), Zibordi (6), Favero (7), De Gasperi (8), Granucci (9), Casalotti (10), Lebre (11), Negroni (12), Leoncini (13), Flori (14) has brought out its specificity with bacteridian anthrax. Examinations made on material made of meats, altered in various ways, or from healthy animals or from subjects affected with any disease and also the researches made with material from animals dead with similicarbuncular diseases, have always given negative results."

* * *

"The object of this study is to bring out the result of a new order of things relating to researches made with the *Ascoli reac-*

tion in applying it to the examination of *sausages,* made with meat from healthy pigs with that of cattle with anthrax. Besides, here are also recorded some controlling experiments made with material taken from animals dead with tympanitis, disease of youth, aviary pest, asphixy and upon sausages in advanced state of putrefaction, seized at the public abattoir of Modena.

"The four samples of sausages examined first were made according to the ordinary manner of making the big Italian sausages called '*mortadelles.*'

"Each of these samples contained 40 grams of healthy pork, 20 of healthy fat and 40 of muscles of anthrax beef, chopped and mixed together in small pieces. To this mixture were added a small quantity of kitchen salt (2 grams), pepper (ogram. 4). Such mixture was then placed in a frying pan to dry them, during twenty-four hours, at a temperature gradually increasing, from 30° without going beyond 60°. The sausages can remain in this last temperature for about six hours.

"These researches were made twice in the 15 to 30 days following the making of the sausages, with the object of seeing if such certain lapse of time had any influence on *Ascoli reaction.* The concentration of the extracts was always 1/25. The sera of Ascoli used were number 4, 8 and 20.

"These researches have shown that *Ascoli reaction* is positive even if the muscle has gone through some of the manipulations (salting, drying) necessary for the making of the '*mortadelles.*'

"For me, this discovery has a very great importance, as it gives us the means to recognize if in the preparations of sausages there entered anthrax meat, a fact which as everyone knows is very difficult to establish with the usual ordinary means of researches.

"By opposition *Ascoli reaction* has always given a negative result when used: 1. with the spleen and blood of a steer dead with tympanitis; 2. with those of a calf dead, asphyxiated; 3. on those of a dog dead with distemper; 4. on those of a chicken dead with pest; and 5. on putrefying sausage of Italy.

"It is then permitted to conclude that *Ascoli reaction* is the

most powerful, the quickest and the surest means to diagnosticate bacteridian anthrax, and that particularly it can be resorted to in the research of the bacteridies in the species of preserved meats which have been salted or dried."

* * *

The contribution of Prof. Silva is closed with a complete bibliography on the subject:

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13. T. Leoncini. Giornale Internationale di Scienze mediche 1911.

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* * *

Practical Warnings.—1. *Cocaine and Its Dangers.*—Any horse that presents no apparent lesions, no painful and tender spot in some region of the anterior leg can be, generally speaking, considered as having the lameness located in the foot or in the phalanges. A long time before the use of local anesthetics this was admitted by practitioners, and the fact of the usefulness of cocaine has proved that they were right. It may be consistent, then, to say that it is, in many instances, without necessity that injections of cocaine can be resorted to so as to locate the seat of lameness, and indeed the positive results are characteristic as, after all, if some are negative and may cause an error, it may be due to an imperfect application of the anesthetic, although there are cases where the injection is negative without a proper cause to explain it, and yet neurotomy will remove the lameness. But if in some instances the injection is sometimes deceitful and can be the cause of error in diagnosis, there are others where it becomes a useless interference and often a dangerous one, and after all if it is a most elegant and demonstrative manner of diagnosis, one must at the same time bear in mind that it is not *without inconvenience* nor *without dangers.*

It is probable that these remarks will surprise many of those who have or are resorting to the injection of cocaine, perhaps in hundreds of cases, to detect or to confirm the diagnosis relating to the seat of lameness in an anterior extremity, but the warning was presented at a meeting of the *Société des Sciences Vétérinaires* of Lyon by Prof. Cadéac, who related three cases which, to say the least, showed a very great coincidence by the lesions presented by the animals to which injection of cocaine had been made. In the first case of a lame horse which was supposed by the owner to be lame in the shoulder, receives cocaine above the fetlock. The lameness is removed. The horse is about to be taken home to return later and be operated, when, after going on a walk 100 yards, he suddenly drops with a comminuted fracture of the first phalanx.

In a second case the lameness was attributed to lesion of the elbow, cocaine is injected and the lameness is removed after waiting a few minutes. At the demand of the owner the test is renewed, the animal is again free from lameness, but then after moving 50 yards on a walk, the fetlock suddenly drops and a fracture of the three phalanges is found at the post mortem.

A third case presents the same history, lameness of the right anterior leg, disappearing with an injection of cocaine, followed after walking a short distance with comminuted fracture of the first phalanx.

Three cases of osteitis, which might have ended by recovery, which had a fatal termination by the temporary removal of the pain which deceived the animal, made him put all his weight on his diseased phalanx with the fatal result, a crushing of the diseased bony tissue.

Of course the three cases of Prof. Cadéac are probably exceptional; I do not know if any similar ones have been recorded, but still the warning that they give is no less valuable.

2. Chronic Nephritis and Its Dangers.—On this disease, principally in dogs and cats, where it is more commonly observed amongst our domestic animals, and on the dangers of practicing surgical operations on "Brightic" animals, the *Annales de*

Bruxelles present an excellent article from Prof. Hebrant and his adjunct, Antoine.

Bright's disease, rarely observed in horses or bovines, is comparatively common in dogs and cats—and probably more so in this last animal. Rarely is a veterinarian called to treat such patients except in cases of severe complications. Without entering minutely in the description of nephritis, which is given by the writers who present the symptomatology and termination of the disease, the attention is called in a concise manner to five cases of animals which were submitted to surgical operations and died because of Bright's disease while they were in the best condition for recovery.

A dog had a cyst of the testicle. He is castrated. Forty-eight hours after he is found dead in his kennel. Post mortem showed lesions of chronic nephritis, no acute lesions of infection existed.

A cat is operated for a cyst of the mammæ, no fever follows. Death the third day with chronic nephritis.

Another cat had metritis. Hysterectomy is performed. No fever for three days. Result hopeful. Death on the third day with chronic nephritis. No peritoneal infection. Wound of the operation was all closed.

A dog is operated for perineal hernia. Three days after dog dies without fever by sclerotic nephritis.

A mammary lipoma is removed from a slut. Death the following day by nephritis.

The warning is plain: never operate an adult animal without having beforehand made a *chemical and microscopic examination of its urine*. If albumin and casts are found, do not operate, or look for post-operating mischief.

* * *

New Nematod in Cattle.—Mr. M. Piettre has presented at the Académie des Sciences the relation of the observations he made in studying from the chemical and histological point of view the processes of calcification of the various lesions of bovines

and principally of the frequency of calcareous deposits round the femoro-tibio-patellar joint, where on both lateral articular surfaces on the skinned cadaver, tracts are often observed, white yellowish in color, more or less irregular, and which after minute dissection are the invaded lateral and capsular ligaments.

The non-tuberculous nature of these deposits being established and after decalcification with picric acid, it was observed that in the middle of the fibrous tissue, more or less modified, there were many small alveoli, of various forms, empty or again filled with fine membranes, of various aspects and coloring easily with hematime. In the centre of the tendinous not calcified structures, Piettre has found a granulous tissue and besides those a fine kytinous membrane, and in one of the alveoli discovered a round worm, and in others in the middle of recent lesions, free embryos rolled upon themselves.

Similar alterations were found in numerous cases of investigations, twenty-six times out of thirty the parasites being located only in the fibrous tissue and almost exclusively in the thickness of the ligaments of the stifle joint, the external being more frequently invaded than the internal, or again in the tendons and fibro-cartilages of the joint and also in the tibiotarsal ligament. The cervical ligament was always free.

The lesions presented by the tissues involved assume three principal forms:

1. Simple dissociations of the fibrous tissues, which are pale yellow in color.

2. Small cavities hollowed in the thickness of the tendons with torn fibrous threads, some having yet their normal characters and others swollen, soft and also yellow in color.

3. Nuclei of conjunctive tissue with inflammatory aspect, brownish or light chocolate in color, easily differentiated from the surrounding fatty deposits.

In all these lesions parasites can be found in all stages of development, some alive, others dead. They are all surrounded with a cuticle impregnated with calcareous deposits.

Raillet and Henry classify the parasite in the family of

Filaridoe, gender *Onchocerca*. Piettre has proposed for it the name of *Onchocerca Bovis*.

There is no doubt that from the pathological point of view, and bearing in mind the importance of the disorders the parasite produces in the articular structure, the observations of Piettre may be of great value.

* * *

The Museum of the Horse.—The little town of Saumur, already known to veterinarians by its military school, has now a new attraction, the only one of its kind in the world, a *museum of the horse*.

In the old historical castle of the city, after its having been used as an arsenal, a powder store house, then a jail, existing since the thirteenth century, repaired many times, and finally classified as an historical monument, a museum consecrated to the history and glory of the horse has recently been officially inaugurated.

Prepared since several years by the initiative and perseverance of the learned chief of the Veterinary Department of the School of Cavalry, Veterinary Major Georges Joly, the museum is now open.

It is divided in two sections, a chronologic and a specific. In the first are represented the ancestors of the horse, the hipparion, the horse of the tertiary ages and those of the polished stone, already domesticated, the solutreans that were used as food, the magdaleans that were already represented in sculpture; specimens of the breeds in the bronze and iron periods; the Assyrians, Egyptians, Greeks, Romans and Gallo-Romans. The horses of the Barbars, that of Attila, of Charlemagne, William the Conqueror, Duguesclin, Joan d'Arc. Finally the horses of modern times, foreigns, Arabs, Normans, Anglo-Arabs, etc., draught and saddle horses, thoroughbreds, Flying-Fox skeletons.

In the specific group, numerous and rare collections are gathered. The complete history of shoeing, from the Solea ferrea of Romans, the many various hippo-sands of the Gallo-Romans, the

undulated shoes of middle-ages down to those of recent and modern times. Wooden and bronze bits, the Roman bridle and the many specimens used in the seventeenth century. Then the various harnesses, all richly mounted; those of the middle age, of the Renaissance, of the Cavalcadors, of the Musqueteers, of the Mexicans, etc., etc. And again vehicles of all epochs from the primitive carts down to the most recent models of the day.

A large and rich library of all kinds of works on Hippiatry completes this valuable museum.

Historically especially the museum of the horse at Saumur presents an unusual interest and there can be no doubt that it will prove a great means of education to veterinarians for everything relating to the horse, and also a rich nest of information for all those who will visit it.

* * *

Bibliography.—If one should refer to the classical work on descriptive anatomy and look on that part of the circulatory apparatus which relates to the lymphatic system it will certainly appear to him as one which, by the description and the illustrations that are given, is of comparatively no great importance. Indeed in one which is much used on both continents, the whole subject is treated just in three or four pages and these are considering the lymphatic apparatus of equines. For the other domestic animals, the differential anatomy of the thoracic duct is given and that is all.

Recently, however, and especially since inspection of meat has been more or less thoroughly organized and put in practice, and that researches of lymphatic lesions have gained in importance, the anatomy of the whole lymphatic organism of the lower class of domestic animals and specially the food-producing animals, has been the subject of laborious work and of good publications which must be of great assistance to the sanitarian. The space that has been given to the illustrated articles of Godbille in *Hygiene de la Viande et du Lait,* to those of Lesbre and Panisset in the *Bulletin des Sociétés Scientifiques Veterinaires*

of Lyon, and the more recent ones in the report of the Bureau of Animal Industry, by Drs. Buckley and Th. Castor, are good evidences of the importance of the subject; and it is therefore with great satisfaction that we are able to welcome and announce the publication of a superior work which we dare say is the only one of its kind, viz.: *Das Lymphgefässystem des Rindes* (the lymphatic system of bovines), by Obermedizinalrat Dr. Herman Baum, professor of anatomy in the Higher Royal Veterinary School of Dresden, published by the Berlin house of August Hirschwald, N. W., Unter den Linden 68.

Dedicated to Prof. Dr. W. Ellenberger, the Rector of the Veterinary High School, the work is presented by a preface giving in a concise manner the plan and object of its contents, followed by the consideration of the four chapters in which the entire work is divided.

While in the first chapter generalities on the technique are given and followed by the preparations of the work and the dissections with remarks also on the terminology and generalities on the lymphatic glands and their vessels, afferent and efferent, in the others are separately considered the glands of the head, of the neck, of the upper part of the extremities, of the chest and its contents and finally of the abdomen and abdominal organs occupying the entire second chapter. This is followed by the anatomy of the thoracic duct and vessels, constituents and the lymphatics that belong to each gland. The entire description forms, of course, the essential part of the whole volume, which is composed of 165 pages and is illustrated by 78 figures presented in 32 bautifully colored plates.

German works on anatomy are always superior by their illustrations and we have already had opportunities in these pages to allude to their correctness, their neatness and the artistic manner with which German works on anatomy have been published. Certainly *Das Lymphgefässystem des Rindes* is fully as good as any that we have ever seen. The drawings are excellent and the coloration of the glands and of the vessels is of great advantage for the students who read the text. The six figures illustrating the

lymphatic system of the head, those of the neck, of the chest with the insertion of the thoracic duct, those of the extremities and the many given of the thoracic and abdominal cavities with their contents, those of the male and female genital organs, all in fact are so characteristic, well done and plain that one may readily make himself thoroughly acquainted with the entire subject by merely careful study of the illustrations.

The work of Dr. Baum is certainly unique, and one of which it can be rightfully said, that it fills a need greatly wanted. But it can also be added that it does it well and that it will prove of the greatest value to the student of anatomy, to the general practitioner and above all, to the specialist, veterinary sanitarian, the meat inspector.

* * *

Acknowledgments and Notices.—*La Vie Agricole et Rurale* (The Agricultural Life) is a new journal which by its editorial staff and by its contents has rapidly made its way as one of the principal publications in France. The last number is altogether devoted to the horse and equine subjects.

The Cape Province Agricultural Journal for May has an interesting article on the Anglo-Norman horse.

The Agricultural Journal of the Union of South Africa contains the continuation of the article on the anatomy and physiology of the ostrich, by Prof. Duerden, and also from Dr. Theiler, that on facts and theories about "Stijfziekte" and "Lamziete."

"The Question of Tick Eradication," by Dr. Peter F. Bahnsen of Atlanta, Ga., and "The Diagnosis of Contagious Abortion in Cattle by Means of the Complement Fixation Test," by F. B. Hadley and B. A. Beach, of the University of Wisconsin, have also been received. A. L.

MEMBERSHIP'S LOYALTY—A. V. M. A.'S STRENGTH.

The forty-ninth annual meeting of the American Veterinary Medical Association goes down into history as the most successful congress yet held by that organization. The fact that its

power for good is constantly being more strongly felt, and that its growth is not merely in numerical strength, marks true progress, and presages a steady and enduring uplift for the American veterinary profession through its powerful and wholesome influences. This strength, out of proportion, it might almost be said, to its membership, is due to the harmonious manner in which its members support its constitution and labor faithfully both as individuals and as a whole, for the accomplishment of the high ideals upon which the association has focused its aim.

This good-fellowship is indigenous to the organization; it has grown up with it and becomes more and more inseparable from it as time goes on. Little ripples appear on the surface at times, but they do not even vibrate the great body of the majestic ship as it continues on its straight and determined course. This fact was borne in upon the members, in the manner in which the administration was supported at the recent meeting, despite dissenting sentiments that had been disseminated during the past year.

Loyalty to the cause has always been an inspiring feature that has characterized the work of members and officers alike in this organization of professional men; and that in itself is sufficient to hold them together and to give to the association the dignity and strength it has displayed in the regulation of veterinary educational institutions, and the influence it has exerted upon the ethical standing of the members of the veterinary profession of America.

We have just emerged from one of the most successful meetings in the history of the association, a meeting the character of which was in many respects unlike any former gatherings, and we are entering upon the work of preparing for the next convention of this mighty organization, of which the character will again be different from the last, and it will require the united effort of every individual member to carry it to the successful issue that the occasion merits. It is an occasion that must prompt an inspiration in the heart of every member, and make him feel like grasping the hand of the chief executive and assuring him

of his hearty co-operation in the great work that the association has made him responsible for in electing him its president. With that spirit in the hearts of the members, and the excellent staff of officers elected to the various positions of responsibility, the preparation for the golden anniversary of the American Veterinary Medical Association has begun under the most favorable auspices, and the success of the occasion is assured.

THE KANSAS "HORSE PLAGUE."

Up to the time of this writing we are not in possession of any authoritative report *direct* from any of the veterinarians or other scientists on the ground as to what the terrible "plague" that has attacked the horses of Kansas and is killing them by the thousands, actually is; although indirect reports seem to indicate pretty clearly that it is of miasmatic origin, and is either "Forage Poisoning," "Cerebro-Spinal Meningitis," or "Borna Sickness," the gross symptoms of which simulate each other in a more or less degree. If it is the first named condition, we shall soon have reports to that effect, as the symptoms and pathology are familiar to American veterinarians, while the last one, so far as we have been able to learn, has not, up to the present, been recognized in this country.

It is described by Friedberger and Fröhner as a miasmatic infective disease, in which the contagium is not conveyed from one animal to another, but is taken up with the fodder and drinking water. It differs from cerebro-spinal meningitis, in that there is no inflammatory changes. It appears with greatest frequency in well fed horses. This malady has long been known in the kingdom of Saxony as an epizootic disease (*Borna, Zwickenau, Plauen, Oelsnitz, Chemnitz*). We feel quite confident, however, that in the very near future, possibly before the last page of this number is printed, that the combined efforts and scientific knowledge of the veterinarians and other scientific workers from the Kansas Agricultural College and from the Bureau of Animal Industry of the United States Department of

Agriculture, working in co-operation with the state veterinarians and private practitioners, will not only result in a positive diagnosis of the disease, but also in a solution of its control, in a manner characteristic of American expedition. That the condition is a terrible one, we are well aware, but we believe that in the light of present-day knowledge, serumtherapy will proclaim another victory, both therapeutic and prophylactic, as soon as the pathology of the disease has been determined; and that in the meantime, the horse owners of Kansas and Nebraska will soon witness the checking of this scourge that is fast depleting their horse stock, through sanitary, and other preventive measures.

[*Addendum.*] Since the above was put in type, we have received advices from the Bureau of Animal Industry of the United States Department of Agriculture, to the effect, that judging from the symptoms and post mortem lesions reported by the government veterinarians who are investigating the horse disease in Kansas and Nebraska, the affection is forage poisoning or so-called cerebro-spinal meningitis. As a result of these reports from the veterinarians in the field, the "Bureau" has sent out a *circular letter, dealing with the cause of the disease, how it may be recognized and how it may be prevented and treated; the immediate result of which, has been a checking of the disease where instructions as to change of feed have been followed. In the meantime, a complete investigation of the affection is being made, looking to the isolation of a specific organism or virus as the causative factor.

The Actual Registration at Indianapolis was 797, being made up as follows: Members 341, visitors (most of whom afterward became members) 277, ladies 179; but this figure of practically 800 registered, does not represent the actual number in attendance, as it is known that a large number of all three classes did not avail themselves of the registration privilege, and therefore the local committee was unable to account for them.

* Published on page 128 of this issue.

ORIGINAL ARTICLES.

HOG CHOLERA SERUM WORK—WITH ESPECIAL REFERENCE TO DISAPPOINTMENTS.*

By M. H. Reynolds, St. Paul, Minn.

I believe it quite safe to say that Dorset-Niles serum, produced and tested according to standard and accepted methods, in proper dose and properly administered, is an established thing in veterinary medicine; that good serum properly used does give a practical protection from cholera.

Abundance of statistics published by reliable men in widely separated portions of the country with different strains of hogs under all possible differing conditions of feed and care, seem to justify this statement.

Our experience in Minnesota has evidently been about the same as that of cholera workers in other states—not invariably pleasant, and our results are not by any means invariably ideal. We meet strange experiences in this work, *e. g.*, the same lot of tested serum and virus sent to two different men at about the same time, in different portions of the state, seems to give surprisingly different accounts of itself in actual use. One veterinarian treats by the serum-virus method nearly a thousand healthy hogs for one man with less than two per cent. loss; the other man loses 76 per cent. of a treated herd.

It is our constant policy to tell owners frankly that on a large average results by the serum-virus method are quite satisfactory and the loss small. We tell them the average loss is small, as compared with possible heavy losses from susceptible hogs in a cholera neighborhood; but we always go a little farther and tell the owner that in occasional cases, fortunately rare, the loss in an individual herd may be very heavy. We give him freely any in-

*Presented to the forty-ninth annual convention of the American Veterinary Medical Association at Indianapolis, August, 1912.

formation he wants and then leave him to operate on his own judgment.

Explanations for disappointments are usually not difficult to find if one can get full information concerning the production, test, and use of serum. In many cases unsatisfactory results follow when the use of serum has been *delayed* until the herd is generally infected. In such case the serum frequently serves to check the disease for a short time, but subsequent losses may be heavy.

Bad results are liable to follow careless handling of the serum, particularly in case of bacterial contamination. A good serum may be shipped from the producing plant and be then kept for days or weeks in a warm express office or in a warm office until it has undergone objectionable changes.

Severe losses may be due to the use of poor, untested serum which should never have been sent out. We can only be sure of potency by careful production and conscientious test.

Impotent serum in case of an outbreak may serve no useful purpose in checking the disease and the herd be worse for its use simply because of handling sick hogs. Infected hogs frequently die sooner after the catching and handling necessary for treatment than would have been the case had they been left alone. In such case death occasionally occurs within a few hours after the handling. Such losses would occur just the same whether the hogs were treated with serum or rain water, and would usually occur a few days later even without the handling; but the owner looks with grave suspicion on any such explanation.

Or good, fresh serum may be handled and used by a careless or incompetent man in such a way as to give disastrous results when the trouble is all due to unclean surgical procedure.

A year or so ago I had the opportunity to visit a large herd, fortunately in a neighboring state, where our serum had been used and unsatisfactory results reported. At the time I saw this herd, the hogs—nearly all of them light shotes—were divided into three lots. The first lot of 45 had done well; there was apparently nothing wrong with them, with the exception of an oc-

casional small swelling at the point of treatment. The second lot of about the same size were unthrifty, some of the pigs were evidently badly out of condition; quite a number of them had marked swellings. The third lot was the most unthrifty—the worst looking lot of hogs I have ever seen. Practically every pig had a large swelling and quite a number had died. These three groups had been treated in the order as described. The work was done by a graduate veterinarian and the same serum was used throughout. I was unable to see the veterinarian. The manager of this farm, a very intelligent man, was present only during the treatment of the first lot and thought that the operator had been reasonably thorough in his surgical cleanliness. After the first lot was treated the manager went into another department and saw no more of the work. Information from other sources indicated that the operator had started out with clean instruments and had been careful in his skin disinfection, etc., and had grown progressively more careless and indifferent with each lot treated.

About two years ago two young veterinarians, both well trained, treated by the serum-virus method about 320 hogs in 300 minutes. These belonged to a city garbage feeder whose pens and yards were in the usual condition as we see it at these places. Some 50 pigs were lost out of the 320, to the owner's great dissatisfaction. A careful study of this interesting experience showed that the first lot treated numbered 45. These had been kept in a clean pen and fed cooked garbage. There had been no loss in this group and no unpleasant results of any kind. The remaining 275 pigs were taken from filthy yards, given treatment and put back into filthy yards. The same serum was used throughout, and further, this same serum was used about the same time on our University farm with the best of results. In addition to this, we have evidence of a very satisfactory serum test for this lot of serum. Autopsies at the garbage feeder's place showed that some of the deaths had occurred as the result of septicemia, there was evidence that some had died from garbage poison, a few had evidently died from inoculation cholera. The

larger portion of the loss was probably due to septic infection. Here we have one lot of serum giving first, a good test; second, satisfactory results when used in a careful way under favorable conditions on the University farm, and in the first lot of pigs treated for the garbage feeder. Later on the two young men were apparently getting tired and in a great hurry to finish.

In another instance we sent serum to two different veterinarians at about the same time. One man treated about 1,000 hogs for one man, using the serum-virus method, with less than 2 per cent. loss. The other veterinarian treated a small farm herd and lost, plainly from inoculation cholera, something over 79 per cent. of the herd, the same serum and the same virus being used in each case.

Where hogs apparently well at the time of vaccination sicken with cholera in about two weeks, the trouble is due to the mistake of using poor serum with standard doses of virus or an insufficient dose of good serum with a standard dose of virus. The herd merely develops cholera in two or three weeks in spite of insufficient or impotent serum.

Some disappointments—possibly more than we have supposed—are due to the use of contaminated virus.

Losses may occur as a result of careless work on the part of the veterinarian. A man may be careless about giving proper doses. He may attempt to economize by using smaller than the directed doses of serum. In other words, a man may be incompetent or careless in this work, just the same as in any other line of work.

Unsatisfactory results come most frequently perhaps in the cases of farmers who wait too long.

Dissatisfaction for which the farmer himself is to blame comes when the farmer insists on treatment by the "serum-only" method of healthy, unexposed hogs after it has been explained to him, as every conscientious veterinarian must do, that "serum-only" treatment with healthy, unexposed hogs gives but very temporary protection.

It should be made evident to owners and veterinarians just as

soon as possible that anti-hog cholera serum is not something which anybody and everybody can use blindly and have good results.

I should like to start some discussion of the general questions as to who should be permitted to use hog cholera serum. We have settled on a clearly defined policy which we are following very closely. Perhaps ours is not a wise policy. This may be a debatable question, particularly in western sections, where veterinarians are not so plentiful and where there are large stretches of country with plenty of hogs and serious hog cholera possibilities and few veterinarians.

General Policies.

It seems to me there is opportunity for discussion as to the best methods of distribution of serum, especially serum produced by a state institution. In some states serum is produced under state appropriations and distributed gratis to practically anybody who asks for it and to be used by anybody who may be able to get a syringe. Other state institutions have their work started by state appropriations and are maintaining it from the sale of serum, believing that this is a much more efficient method of distributing than the other. As a basis of discussion on this point I will present our Minnesota method, not insisting at all that it is the correct method or the best available by any means. Our serum is produced by the State Agricultural Experiment Station. It was started by direct appropriations from the Legislature, for buildings, equipment, etc., and for research work. The routine serum production has since been supported by sales of serum. Our serum is sent out exclusively by express C. O. D. either to owners or veterinarians, but only for use by well-trained veterinarians so far as we are able to know and control. During the present year we have restricted still further our distribution of serum for the serum-virus method, limiting it to veterinarians in state employ; *i. e.*, either sanitary board or station. This has been a difficult and embarrassing question for us. There are good arguments for and serious objections to this particular

portion of our policy. There are of course plenty of well-trained veterinarians, careful men, to whom we would gladly send serum and virus if we were able to discriminate. But a serum producing plant in a state institution like ours can not discriminate in any such way. If we send serum to be used with virus by careful and competent Dr. A we must also send it to Dr. B who may be very careless and unsafe in his surgical method and not the man to be trusted with an agent with such possibilities of harm as virulent hog cholera serum. We adopted this policy only after careful consideration at a joint meeting of experiment station and sanitary board veterinarians. We realized at the time that we were on debatable ground, but the weight of reason seemed to be distinctly in favor of the method adopted.

Bad results following use of serum which had stood perfect test; serum which had been used among University Farm hogs with results that were entirely satisfactory and used with good results by other practitioners in the state have seemed to force us into this position. On the other hand there may be many farmers having healthy herds in hog cholera neighborhoods. These farmers may be willing and even anxious to immunize their hogs and there may be no state man available for serum-virus work. Serum-only treatment for these healthy unexposed herds gives immunity that is evidently too brief to be practical and leads to useless expense and dissatisfaction in case of subsequent failure to protect.

Such farmers who should have opportunity to have their hogs permanently protected are liable at any time to be deprived of that opportunity. If we refuse to send serum to an incompetent non-graduate, there comes a fine opportunity for owners in general and friends of the non-graduate in particular to cry unfair discrimination, jobbery, graft. If the untrained veterinarian is the only man available within a long distance and the state is unable to send a man, then farmers are not able to get even serum-only immunity for their hogs.

The pros and cons of discussion on this point could be drawn out at very great length, but I trust that this will be sufficient

to start a discussion that may clear the atmosphere and show who is right. Our station sends serum for use by trained veterinarians only. Authorities in other states send it indiscriminately to any one who asks for it and has the price. Who is right? May one policy be right and best in one state and a reversal of this be best in another?

Our general method of distribution is given fully in our Hog Cholera Serum Treatment Agreement which is signed by the owner and attendant veterinarian and another circular "Conditions for Distribution of Hog Cholera Serum," both of which are here submitted and read as follows:

"HOG CHOLERA SERUM AGREEMENT.

"The Veterinary Division of the Minnesota Agricultural Experiment Station does not guarantee the protection of hogs against hog cholera or any other diseases. Inasmuch as the vaccine is produced as an accommodation to owners the Institution assumes no responsibility in vaccination, excepting as to care in preparing, testing, and distributing the serum.

"Figures showing actual results of several years' work are freely given to owners, who must then decide for themselves and assume their own responsibility for vaccination. We are glad to advise as to method, time, etc.

"Excepting in cases which plainly call for unusual action, serum will not be furnished for the serum-virus (simultaneous vaccination method) except by veterinarians in state employ.

"Owners must understand that the serum-virus or double vaccination carries some risk, which, on a large average, is small when tested serum is used in full dose carefully administered and with proper dose of virus. In an occasional herd the loss may be considerable.

"The use of 'serum-only' is safe, but should be restricted to recently infected herds and to hogs that will be given plenty of pen exposure at the time or very soon after treatment with serum. We do not under ordinary circumstances advise 'serum-only' treatment of unexposed hogs, because the duration of protection thus given is usually short. After a few weeks such hogs may take the disease and die.

"This Institution assumes no responsibility beyond care in production, testing, and distribution of serum.

"Anyone wishing hogs treated with Station serum must agree to these conditions and sign this statement.

"Signed.....

"Date.....

"Place.....

"Countersigned by the veterinarian treating the hogs.

"Signed....."

"CONDITIONS FOR DISTRIBUTION OF HOG CHOLERA VACCINE.

"Injections to be made in the axilla or on the inner and upper portion of the thigh, not in the groin.

"Serum may be sent only by express C. O. D., or for cash in advance, for use by responsible veterinarians, on healthy hogs, in the early history of outbreaks. Serum cannot be accepted for credit on being returned. An order must constitute a sale under all ordinary conditions.

"Veterinarians must agree to not use serum where the disease has prevailed for some time and the herd is already badly infected.

"The serum must be used *in full dose as directed.* Give full dose or none at all. Keep serum cool.

"A report of vaccination must be made and signed. Blanks for such reports will be furnished.

"No vaccination should be done until the owner has first signed the blank (to be furnished), stating that he understands conditions and assumes responsibility. This (owner's blank) is to be returned, together with the vaccination report to University Farm, Saint Paul, Minn."

Our schedule of doses is as follows, given in full on every bottle of serum sent out.

Standard Dose of Serum.

Up to 20 pounds.....	10 c.c.	100 to 150 pounds.....	30 c.c.
20 to 50 pounds.....	15 c.c.	150 to 200 pounds.....	35 c.c.
50 to 75 pounds.....	20 c.c.	Over 200 pounds.....40 to	60 c.c.
75 to 100 pounds.....	25 c.c.		

"In herds where cholera has made its appearance increase these doses 50 per cent.; and for simultaneous treatment with virus for permanent immunity, the above serum dose should be doubled.

Virus Dose.

Up to 20 pounds.....	0.5 c.c.	100 to 200 pounds.....	1.5 c.c.
20 to 100 pounds.....	1 c.c.	Over 200 pounds.....	2 c.c.

Experience has taught us that the margin between serum test dose and the dose to be given in field work should be very wide. In brief our plan for testing serum is to mix all bleedings from a given hyperimmune and use two test pigs for each such mixture; *i. e.*, two test pigs for each hyper. Each receives full dose of tested virus. One test pig receives 75 per cent. of serum-only dose previously mentioned. The other pig receives full serum-only dose for weight. We ask our serum to protect in the three-quarter serum-only dose. This is practically our test dose. Up to date we have been directing that for field work serum-virus method serum should be administered in dose equal to one and one-half times the serum-only dose for weight; *i. e.*, 50 per cent. increase over serum-only dose or double the three-quarter dose which we require shall fully protect the test pig before the serum is labelled potent. We are now getting out a new dose label and our advice for serum-virus method is use double the serum-only dose instead of one and one-half times the serum-only dose. For use in sick herds we advise an increase of 50 per cent. over the standard serum-only dose.

Needed Information.

Those of us who have been in the hog cholera serum work for several years are in a position to appreciate painfully at times the fact that there are many important problems still to be worked out. We need more information concerning conditions affecting potency of serum; information; *c. g.,* concerning the effect of light, heat, presence of red blood cells, stronger preservative, etc. We would like very much to know just what part, if it has any, *B. cholera suis* plays in the etiology of hog cholera and in the efficiency of our serum. We need very much a laboratory test for potency. If some one would only work out a reliable laboratory test for potency of serum, he would have the immediate gratitude of all serum workers. Such a test would greatly economize time and expense of producing and do away with the uncertainties and variabilities of individual pigs used for serum test purposes.

Economy of Production.

It would be very desirable, indeed, if we could greatly reduce cost of production. Formerly we used pigs raised and selected for us by several breeders with whom we have special arrangements. This has given us the color, type and weight that we prefer. It has given us pigs from dams that were quite certainly susceptible, etc., but it has been expensive. In our later work we have economized very considerably by using stock yards' pigs as virus producers, but continuing the especially selected pigs for test purposes. This gives us virus pigs at about one-half of what we have been previously paying.

There is a great waste and one which would seem to be unnecessary in the common failure to utilize the carcasses of virus producers. Some serum plants are rendering virus producers and making tankage, but I think not many. We have found that these carcasses can be quite easily cooked by steam so that they may be crushed and mixed with meal feed. Our hyperimmunes and other hogs were extremely fond of the mixture and it is presumably an extremely good feed for hyperimmunes. How-

ever, there appeared a difficulty which we have not yet overcome, that of stinking troughs in warm weather. If hogs could be so carefully fed that they would clean out their troughs thoroughly and these troughs could then be sunned and dried or possibly washed out in warm weather, it would seem that this difficulty could be overcome.

Dr. A. C. ARMSTRONG, of New York City, died at the French Hospital, that city, as a result of blood poisoning, on Tuesday, September 24. The doctor had not been well for some time, and entered the hospital for treatment a week prior to his death.

PROTECTIVE VACCINES is the caption of an article in the Baton Rouge, La., *Country Review*, by our esteemed collaborator, Dr. W. H. Dalrymple, in which he sets forth the dangers resulting from relying *completely* upon these agents for the control and eradication of diseases, and losing sight of the great necessity of sanitation in connection with their use. He cites an example of this oversight in the following paragraph:

"When an outbreak of charbon or hog cholera takes place among a farmer's stock, he loses no time in his effort to secure anthrax vaccine, or hog cholera serum, as the case may be, which, necessarily, is the proper thing to do. But what does he often do with the carcasses of the animals that, unfortunately, succumb to one or the other, or both, of these diseases? The chances are, he may haul them off to some convenient spot where buzzards, or other carrion feeders, can feast from off their germ-seething bodies and carry the infection far and wide. Or, he may dump them into some running stream so that his neighbors below may get a 'dose of the same medicine' among their stock. We do not mean to presume, of course, that he intends it this way; but, nevertheless, infection is often spread in just such manner."

After a full and interesting discussion of the subject, the doctor concludes his article by saying:

"By all means protect the living animals, but don't forget that the dead ones, and their surroundings, are what furnish much of the 'seed' for future infection."

It is these articles written directly to the animal owners that do so much toward building up the defenses and broadening the scope of sanitary science.

USE OF THE FERMENTATION TEST IN DAIRY INSPECTION.*

By L. A. Klein and H. C. Campbell, University of Pennsylvania.

The different species of bacteria most commonly found in milk may be grouped according to the character of curd they produce when the milk is kept at a temperature of 37° to 38° C. Organisms that ferment the milk sugar and form lactic acid produce a solid, homogeneous, jelly-like curd, with little or no fluid. Another group of species, including the bacilli of the subtilis and mesentericus group, produce a rennet-like ferment that coagulates the casein and a proteolytic ferment that digests or peptonizes it. The different species in this group produce the two ferments in varying proportions. When the rennet-like ferment predominates the curd is hard, contracted, in one or several pieces, floating or suspended in more or less fluid, which is almost entirely clear but may have a greenish or whitish tinge; it is slowly digested. When the proteolytic ferment is dominant then the curd is soft, flocculent and "mushy" or coagulation does not occur at all, but peptonization is rapid. These are the so-called "cheesy" or "peptonized" curds. The staphylococcus pyogenes and the bacilli of the proteus group also produce a "peptonized" curd.[1] The bacteria of the coli-areogenes group produce a jelly-like curd, permeated more or less with gas bubbles, in one or more pieces, floating or suspended in a turbid fluid, which may also exhibit collections of gas bubbles. A "flaky" or granular curd, associated with fluid that is turbid and may be whitish, yellowish or otherwise discolored, is produced by a species of yeast that ferments lactose.

Species representing all of these groups will be found in any sample of milk. The time of curdling will depend upon the number of bacteria in the milk and the temperature at which

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it is kept, but when the milk is kept at a temperature of 37° to 38° C., the kind of bacteria present in greatest proportion will determine the type of the curd, except when the milk is very rich in bacteria. Then, according to O. Jensen, the lactic acid forming organisms are so numerous that they suppress the other species and a jelly-like curd is usually formed. The character of the curd can therefore be taken as a criterion of the bacteriological properties of the milk under examination, and, furthermore, as indicating the variety of fermentation or decomposition the milk will undergo with age.

Upon these principles was founded the fermentation test. This test, first proposed by Prof. J. Walter, of Switzerland, and subsequently improved by A. Peter and others, has been in use for years in cheese factories to detect milk unsuitable for cheese-making.

It is very simple and does not require any special apparatus. In cheese factories large test tubes or bottles holding from 120 to 140 c.c. or smaller test tubes of 40 to 50 c.c. capacity are used for the milk samples. They are closed with a rubber stopper and are held at the required temperature in a water bath. In our work we have used test tubes of 50 c.c. capacity closed with a cotton plug in the usual manner for bacteriological work. This size tube is to be preferred to that usually used for bacteriological cultures because with the greater quantity of milk that can be placed in the larger tube the test is more reliable and the result is easier determined.[2] We have also used an ordinary incubator in place of a water bath.

The test tubes are washed and cleansed in the usual manner, plugged with cotton and sterilized by heating in a hot air sterilzer for 2½ hours at a temperature between 150° and 160° C. It is quite important that the tubes are sterile, as any organisms in the tube would develop in the milk and might influence the result. The tubes are numbered with a paraffine pencil to correspond with the sample of milk and are then filled to within a finger's breadth of the bottom of the cotton plug, closed with the cotton plug and placed in the incubator. In transferring the

sample of milk from the vessel in which it was collected to the test tube the necessary precautions should be taken to prevent contamination.

Twelve hours after being placed in the incubator the samples are examined. If the milk was fresh and normal there will be no change apparent except perhaps a clean, sour odor. "When the cream layer is bulged upward, or there is a greenish layer beneath it, this is an indication of the beginning of fermentation or curdling."[3] If there is no change at this time, then the samples are to be replaced in the incubator and observed again in 12 hours, and subsequently at 12-hour periods, if necessary. When curdling does not occur after 12 hours then the reaction of the milk should be taken and preservatives tested for. If the milk is curdled then the character of the curd is to be noted. As was first pointed out by A. Peter,[4] the various curds may be classified into five types or classes, with three degrees or variations for each type. He also proposed a system of symbols or abbreviations to be used in recording the results of tests. This classification and the symbols have been followed by us in the main.

The types of curd and the symbols by which they are recorded are as follows:

1. *Jelly-like Curd.* $J._1$—Solid, smooth, white, jelly-like curd, with no fluid. $J._2$—Curd same but showing very few furrows or gas holes. $J._3$—Curd presents furrows, gas holes or cracks, with some fluid.

This type of curd indicates that the lactic acid forming bacteria predominate, and if it is present at the twelfth hour or before indicates that the original contamination with this species was excessive or that the milk was old. According to O. Jensen, however, milk very rich in bacteria will always give this type of curd because in such milk the lactic acid formers are as a rule present in such large numbers that they repress the other species.

2. *Peptonized Curd.* The curd may be hard, contracted and in one or several irregular pieces or soft, flocculent and mushy, with more or less fluid that is entirely clear but may have a

greenish or whitish tinge. $P._1$—The amount of fluid is small in proportion to size of curd. $P._2$—Increased amount of fluid. $P._3$—Amount of fluid large in proportion to the size of the curd.

3. *Gaseous Curd.* A white, jelly-like curd, showing small holes due to gas formation and in the higher degree presenting a sponge-like appearance; may be torn and a portion driven to the top; more or less fluid present, which may also show collections of gas bubbles. $G._1$—Gas holes in the cream layer or in the curd. $G._2$—Gas holes numerous in the cream and curd; gas bubbles may also be present in the fluid. $G._3$—Curd sponge-like, containing many gas holes; may be split and a portion driven to the top; gas bubbles in fluid.

4. *"Flaky" or Flocculent Curd.* Curd in flakes, associated with a turbid fluid, which may be whitish, yellowish or otherwise discolored. $Flc._1$—Curd in fine flakes or partially homogeneous. $Flc._2$—Large flakes and considerable fluid. $Flc._3$—Large flakes, torn, with white or discolored fluid.

Comparison of the sources of the several species of bacteria usually present in milk with the groups of species producing the different types of curd showed a striking parallel between the individual sources and the several types of curds. The lactic acid forming organisms which produce the jelly-like curd are found in greatest abundance in the milk vessels and apparatus. Of the peptonizing bacteria, the species most common in milk are those which inhabit the soil and which are brought into the stable in the dust on the dry fodder and straw and disseminated in the air of the stable when the fodder and straw is distributed. When a cow lies down upon dusty straw or upon a dusty place at pasture some of these organisms may also get into the folds and creases of the skin of the flanks and udder. The gas-forming organisms of the coli-areogenes group are normal inhabitants of the intestinal tract and are eliminated with the feces.

In view of these facts we decided to use the fermentation test in our regular dairy inspection work to determine its value as a means of detecting the principal source of bacterial contamination. Many regulations for milk control fix a maximum

limit for bacteria and when this limit is exceeded the dairyman is merely notified or an inspector is sent to the farm to endeavor to discover the cause. A test that will point out the principal source of contamination in such cases would be of great assistance in improving the condition.

In our work the method of counting bacteria, approved by the American Public Health Association, is one of the routine tests, but in order to obtain as much material as possible we did not confine our investigations in connection with the fermentation test to those instances in which the bacterial standard had been exceeded, but made an inspection at the farm whenever the result of the fermentation test seemed to make it desirable for our purpose. The result of the laboratory tests and farm inspections are given below:

Milk from Dairy Farm No. 1—Fermentation test: Gaseous curd showing some peptonization at the twelfth hour. Number of bacteria per c.c., 59,200.

On a visit to this farm it was found that the cows were standing in two rows, facing outward, with less than four feet space between the posterior ends of the animals. Almost every cow, in switching her tail, would strike the cow opposite her in the other row. When urine or soft manure was voided by a cow in one row it splashed upon the rear parts of the cow opposite in the other row and presumably, also, upon the milker and into the milk bucket if they happened to be present at the time. Midway along the length of the rows of cows, and in the middle of the alley between the two rows, an iron rod 4 feet long and bent at the lower end to form a hook, was attached by the opposite end to the ceiling in such a manner as to permit it to be let down when desired. One of the stable men said this was used to hang the filled milk pails on until they could be carried out of the stable to the milk room, but at the time of the visit three filled milk pails were standing on the floor of the alley between the cows. It was in June and the cows were very busy switching at flies, and the feces were soft and abundant. The conditions certainly favored fœcal contamination of the milk.

Dairy Farm No. 2—The dealer receiving the milk from this farm has bacterial counts made in his own establishment. From September to December the counts ran from 4,000,000 to 1,000,000, and the dealer requested an investigation. A sample of milk from the herd was examined in our laboratory in the latter part of December, with the following results: Fermentation test, $J._2$, $P._1$. Number of bacteria per c.c., 22,800.

Inspection at the farm showed that the cows and stable were kept only fairly clean. It was also learned that the dry fodder was fed before milking and that straw was used for bedding. The milking was done with machines, but the last milk had to be removed by hand. During the milking of a cow it was not uncommon for one of the teat cups to fall off into the litter, the sucking action being continued while it lay there. In several instances it was also observed that soiled hairs on the udder had been drawn down into the mouth of the teat cup. The result of the curd test having indicated the predominance of the lactic acid forming bacteria, especial attention was given to the condition of the milk vessels and apparatus and the methods of cleaning them. Small particles of coagulated milk were found on the inner surface of the buckets of the milking machines. The interior of the tubes and cups of the machines could not be examined, but there was good reason to believe that a similar condition existed there. After each milking, it was the custom to wash the tubes and cups with hot water from the boiler in the milk room and then place them in lime water until the next milking. The buckets were also washed with hot water. The dairyman was advised to rinse out the apparatus and buckets with cold water before washing with hot water, and also to feed the dry fodder after milking. There was no further complaint from the dealer regarding the milk. The conditions found confirmed the result of the fermentation test.

Milk from Dairy Farm No. 3—Fermentation test, $G._2$, $P._1$. Number of bacteria per c.c., 4,740.

Inquiry developed that the men were late in getting to the barn in the morning and the stable and cows were not cleaned

a sufficient time before milking to permit the dust to settle. This was in agreement with the indication of the fermentation test.

Milk from Dairy Farm No. 4—Three samples of milk from this farm were examined at intervals of one week, with the following results:

First sample: Fermentation test, $P._3$, $G._2$. Number batceria per c.c., 9,300, including many colonies of staphylococci.

Second sample: Fermentation test, $P._2$, $G._1$. Number bacteria per c.c., 25,800, including many colonies of staphylococci.

Third sample: Fermentation test, $P._1$, $G._2$. Number bacteria per c.c., 2,400.

The farm was visited two days after the last sample was examined. It was learned that at the time the milk represented by the first sample was produced there were three cows in the milking line with a vaginal discharge, the result of a retained placenta. At about the same time some excessively acid ensilage was reached in the silo, and when this was fed to the cows it made many of them "scour," several so badly that they had to be treated for diarrhœa. This condition continued for some time. On the day of the visit no cows were scouring, but the stable still showed some evidence of the condition that had existed. There was also one cow with a slight vaginal discharge—one of the the three before referred to.

Staphylococci produce a peptonized curd and it is probable that they were largely responsible for the peptonization shown in these tests, the milk being contaminated with the vaginal discharge. The loose condition of the bowels would favor the contamination of the milk with the coli and aerogenes species. The indications of the fermentation test can be regarded, therefore, as confirmed.

Milk from Dairy Farm No. 5—Fermentation test, $G._1$, $P._1$. Number of bacteria per c.c., 361,400. Numerous colonies of streptococci on plates.

When the farm was inspected the cows and stables were found to be soiled with manure. There were thirty-nine cows being milked and only one man to clean the stable and the cows,

although he had the assistance of another man to milk. Three cows had alterations indicating catarrhal mastitis in the udder. The milk of one contained streptococci and leucocytes in large number, and in the milk of another numerous leucocytes were found. Neither streptococci nor an abnormal number of leucocytes were found in the milk of the other one.

The condition of the stable and cows corresponded with the result of the fermentation test.

Milk from Dairy Farm No. 6—Fermentation test, $J._2$, $P._1$. Number of bacteria per c.c., 179,000. The number of bacteria per c.c. in the milk from this farm had been running below 10,000 for more than a year and an investigation was therefore made to discover the cause of an increase. It was learned that during the colder parts of the year it is the custom at this place to store the milk over night in the milk house without ice, after it had run over the cooler and been bottled. In warm weather the milk is iced after being bottled. At the time the milk tested was bottled the weather turned suddenly warm in the evening but no ice was used. After that day the milk was iced and the bacterial count returned to the usual number. No condition in the stable or in the cows and no defect in methods was discovered that would increase the bacteria in the milk.

The condition on the farm therefore confirmed the fermentation test.

Milk from Dairy Farm No. 7—Fermentation test, $P._2$, $J._1$. Number of bacteria per c.c., 34,600. The bacterial content of this milk is usually below 8,000.

On the day the milk was produced from which the sample was taken, hay was being hauled to the barn and put into the loft above the cow stable. The unloading was done at one end of the barn where there were three doors opening into the stable, and was continued during the entire time the cows were milked in the afternoon. On this day the platforms were taken up in about one-half of the stalls in the stable and new ones put in.

The indications of the fermentation test were also confirmed in this case.

Conclusions.

In all seven investigations the fermentation test proved to be a correct criterion of the principal source of bacterial contamination and was of material assistance in discovering the cause. We are not unmindful of the fact that our cases were rather few in number and that it would be desirable to have a larger number, but we are of the opinion that the results obtained indicate that the fermentation test is likely to prove of great value for the purpose mentioned.

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2. Barthel, Chr.. Die Methoden zur Unterschung von Milch und Molkereiprodukten, Zweite Auflage, p. 120.
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Wedding Follows Closely A. V. M. A. Convention.—Dr. Horace Preston Hoskins, St. Paul, Minn., was married September 2, 1912, to Miss Anna Mary Smith, in Christ Church, St. Paul. Dr. Hoskins' friends who met him at Indianapolis little suspected the cause for his unusual happiness during the four days of the convention, which they now realize to have been pleasurable anticipation of meeting his bride after the convention was over. We congratulate the young couple and wish them all the joy and happiness that belong to the nuptial state.

Motor Truck Causes Painful Accident—We were grieved to read in the New York *World* of September 7 of a painful accident to Mrs. Samuel W. Taylor, wife of the esteemed editor of the Rider and Driver. The newspaper report states that Mr. and Mrs. Taylor were in a break driving to the railroad station, at their country home in Stamford, Conn., when a motor truck startled the horse, which was a spirited animal, and caused it to "bolt," and on being pulled up by Mr. Taylor, lashed out with its hind feet, kicking Mrs. Taylor on both legs, shattering the knee cap of one of them. Mr. Taylor was about to start for Syracuse at the time, to manage the New York State Fair.

RADIAL PARALYSIS, AND ITS TREATMENT BY MECHANICAL FIXATION OF KNEE AND ANKLE.*

By George H. Berns, D.V.S., Brooklyn, N. Y.

Attention was called to this striking and very peculiar form of lameness in horses, by Günther in his Myologie, as early as 1866. Möller in 1875 diagnosed it as paralysis of the radial nerve, and later on it was observed, and fully described by Frohner, Hess, Cadiot, Hell, and others. In fact, it is referred to in almost every recently published work on veterinary surgery.

In Dollar's translation of Cadiot's "Clinical Veterinary Medicine and Surgery," an entire lecture is devoted to the subject. In it he presented a beautiful clinical picture of the disease and its symptoms, and mentions external violence or mechanical injuries to the radial nerve and the structures it supplies as its chief cause.

Möller, according to Cadiot, divides his cases into three groups, viz.: complete, incomplete, and partial, and the symptoms vary according to the degree and extent of the injury and resulting paralysis.

The symptoms are minutely and most accurately described by Cadiot, and I cannot do better than to use his own words:

"In complete paralysis the joints of the affected limb, with the exception of the shoulder, are usually flexed when the horse is resting. In consequence of loss of power in the triceps and anterior brachial muscles, the arm is extended and straightened on the shoulder, the scapulo-humeral angle is open, and the elbow depressed. The forearm is flexed on the arm by the contraction of the coraco-radialis, while the metacarpus and phalanges are bent by the action of the posterior anti-brachial muscles. The knee is carried in advance, level with, or in front of, a vertical

*Read before the forty-ninth annual meeting of the American Veterinary Medical Association at Indianapolis, August, 1912.

line dropped from the point of the shoulder. The hoof is usually rested on the toe, but when advanced beyond the above mentioned vertical line it may be placed flat on the ground, the joints then being less markedly bent. When the limb as a whole is flexed, it may be brought into normal position by thrusting back the knee with sufficient force to counteract the action of the flexor muscles.

"In walking, the shoulder and arm are more or less 'carried,' the lame limb being moved as a whole; but as the lower portions of the limb are insufficiently extended, the stride is much shortened. The least attempt at placing weight on the leg causes all the joints to become flexed and the shoulder and arm to suddenly drop; the animal, feeling itself falling, instantly transfers weight to the other limb. At a more rapid pace the animal goes on three legs, as though suffering from some exceedingly painful condition.

"Incomplete paralysis may either constitute a stage in recovery from complete paralysis, or an independent condition. At rest the limb is held as in the preceding form, but the entire plantar surface of the hoof more frequently comes in contact with the ground. In moving, lameness is less marked, and instead of occurring at every step may only appear at intervals, varying in length with the degree of paralysis, rapidity of movement, and smooth or rough character of the ground. The limb is slowly advanced, the stride shortened, and the hoof carried or dragged along the ground. The animal stumbles over the smallest obstacle, the limb immediately becoming flexed.

"In partial paralysis most of the muscles supplied by the radial retain their function, and disturbance is much less marked. As a rule, the position of the limb at rest is normal. During movement it is fully extended, the stride is of ordinary length, and the joints do not collapse when weight is placed on the limb. Slight lameness is visible at a trot, the shoulder and arm being more or less markedly carried forward, without, however, rolling outwards, as in paralysis of the suprascapular nerve."

According to European writers, the disease is self-limiting,

and in all cases, except those complicated with fracture of the first rib, the prognosis is comparatively favorable, and no special line of treatment is indicated further than rest in slings in severe cases, massage, cold douches, light blisters, and, when convalescing, gentle exercise on level ground.

While this condition is by no means of frequent occurrence, I venture the opinion that a large number of the gentlemen present have seen cases of it.

When we first began to use an operating table for operations upon the feet, we used the McGee-Hodgson table, which has a very large and perfectly square top, and in order to bring the affected foot within comfortable reach of the operator it was necessary to fasten it close to the front edge of the table, extending it probably twenty-four or thirty-six inches in advance of its fellow, which was secured in a natural vertical position.

In this position all the flexors of the limb, and more particularly the triceps and anterior brachial muscles, were greatly distended, and if our operation were prolonged or the animal struggled a great deal, it frequently happened that he would come off the table suffering from a mild form of radial paralysis. In casting horses with the English hopples, and keeping them in lateral recumbency for a long time, or horses cast in a stall, and unable to rise without assistance, the same thing would occasionally occur.

We attributed this condition to functional disturbances of the muscles probably from over-distention, or a disturbed circulation from the awkward position of the limb, or prolonged inordinate pressure. We paid but little attention to them, and they all got well in time, varying from a few hours to one or two days. Since our operating table has been altered, and this extension of the limb is no longer practiced, we have no more cases of radial paralysis from table restraint.

In the winter of 1897 and 1898 four severe cases of radial paralysis were brought to my notice.

Case No. 1—A large truck horse, owned by Mr. J. A. P., while backing a heavy load, slipped and fell. When again on

his feet, he was unable to place any weight upon the off front leg. He was carted home in an ambulance and I saw him shortly after the accident, when he showed all the symptoms of an aggravated case of radial paralysis. He was standing in a single stall, and we found it impossible to back him out, for the moment he attempted to place weight upon the affected limb the entire leg would collapse, the elbow dropping to within twelve to eighteen inches of the floor, the body descending, and only by instantaneous shifting of the body weight upon the sound limb would he save himself from falling. He was placed in slings, treated as outlined above, but showed no improvement during the first two months. Then he was fired and blistered over the triceps muscles, which showed marked atrophy. In ten days he began to show a little improvement, was placed in a large box stall, and allowed to lie down. Fortunately he got up without assistance, and he was left alone for the rest of the winter, turned out to pasture in the spring, and finally recovered in seven or eight months.

Case No. 2 was seen in consultation with the late Dr. R. R. Bell, about three weeks after I had placed the J. A. P. horse under treatment.

His case was almost a fac-simile of mine. It was treated with hypodermic injections of strychnine in addition to the local treatment, and I saw him in a pasture field six months later much improved, but still lame.

Case No. 3 was another consultation; call this time with Dr. Elisha Hanshew, on his own driving horse. He slipped and fell, sustained radial paralysis, and was treated for several months and finally disposed of as practically incurable.

Case No. 4 occurred in my own practice. A heavy draft horse, examined by me for soundness in January, 1898, developed a radial paralysis in February as a result of a runaway accident. This, like the preceding three cases, was also an aggravated form of complete paralysis. He was treated for six weeks at the owner's stables without apparent results, and the owner then decided to have him destroyed, but finally consented to have him

sent to our hospital in an ambulance for experimental treatment at our own expense.

Having noticed the dropping of the elbow, and the enormous elongation and stretching of all the muscles situated in the scapulo-humeral angle in all these cases, it occurred to me that some benefit might be derived if these muscles could be placed in a state of rest. With this object in view, and after considerable experimentation, I succeeded in devising the iron knee and ankle brace here illustrated.

I invited Drs. R. R. Bell and Elisha Hanshew to see it tried on Case No. 4, which had arrived and was occupying a large box stall. With great difficulty the horse was brought out upon the operating floor, a distance of probably twenty feet. The entire limb was carefully wrapped in cotton, and a large pack placed in the posterior radial region; the bar shoe with the extension spur was applied, and with the assistance of two strong men, one pulling the knee and the other pushing it in a backward direction, we succeeded in placing the limb in a perpendicular position, slipped the brace into its proper place, and with the aid of a stout strap placed in front of the knee, and over the brace behind the knee buckled tightly, retained the brace in position until it had been securely bandaged to the limb, from the fetlock to the elbow.

The animal immediately seemed to realize the great support and comfort the brace afforded by placing his weight upon the paralyzed limb, and with a little assistance by pulling the leg forward and outward, he soon learned to walk into a single stall, a distance of forty or fifty feet, where a sling was placed under him.

The patient, as well as his brace and bandages, was carefully watched, but as no swelling, restlessness or symptoms of discomfort appeared, he was left undisturbed for eight days, when Drs. Bell and Hanshew were invited to see the brace removed.

The animal was backed out of his stall without any trouble, walked to the operating floor with no assistance, and when the brace was taken off, to our great astonishment and gratification,

he walked a distance of at least ten feet without showing the slightest sign of weakness. The leg then began to tremble and would have probably collapsed if the brace had been left off, but after a good hand rubbing it was re-applied. The following week the brace was removed every second day, the leg massaged, and a little exercise on perfectly level ground allowed. After that the shoe was removed, the brace taken off, and the patient allowed to lie down in a box stall. He was regularly exercised, and two weeks later, four weeks from the date the brace was first applied, he was sent home and did excellent service for his owner for years after.

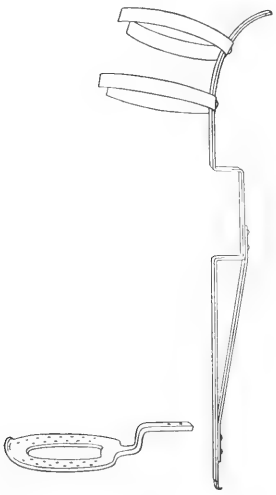
Fourteen years have passed since we first used this knee and ankle brace, and we have employed it in probably twenty-five or thirty cases, all of which have made satisfactory recoveries in from one to three weeks; but it is only fair to add that possibly one-half of this number would have recovered without the brace. However, we made it a rule to use it in all cases of two days' standing. It is also very probable that none of these cases was complicated with a fracture of the first rib or severe injuries to the brachial plexus.

Now a few words as to the brace itself, its object, and mode of application.

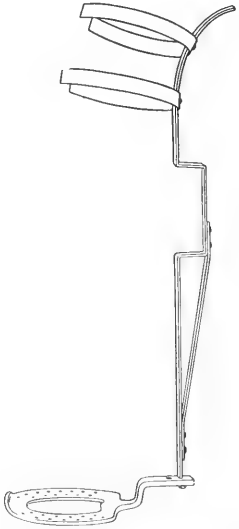
It was designed to fix the limb in a perpendicular position and to place the paralyzed muscles in a state of rest, without causing undue pressure upon any part. If properly applied, a space of an inch or more is left between the brace and the leg from the foot all the way to the centre of the forearm, where the brace is slightly curved in a backward direction and rests upon the fleshy bellies of the flexor muscles, which should be well padded with small cushions or pillows made of aseptic wool, and changed frequently during hot weather to prevent maceration of the skin from perspiration.

As the connection between the extension spur of the shoe and the brace proper admits of a limited amount of motion, the patient soon learns to secure comfort by placing the limb in advance of its fellow, partly turning in the toe, resting on the spur

of the shoe, and releasing all pressure from the posterior radial region. Straps and buckles attached to the brace would improve its appearance and probably simplify its application, but fear of severe pressure and troublesome sloughs prompt me to use ordinary roller bandages, which enables me to exert an equal amount of pressure upon the leg from the foot up to and including the forearm, and thus the danger of pressure necrosis is reduced to a minimum.



Iron Brace and Shoe for Knee and Ankle Fixation (Berns).



Iron Brace and Shoe for Knee and Ankle Fixation (Berns).

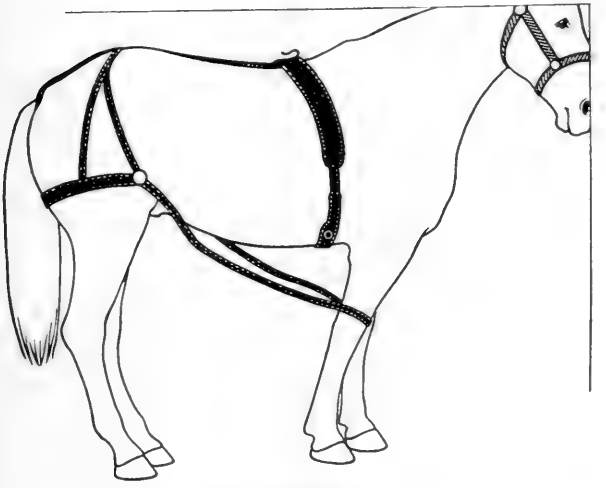
Iron Brace and Shoe Attached — Radial Paralysis (Berns).

Now, the interesting question arises—Why is this simple treatment so effectual?

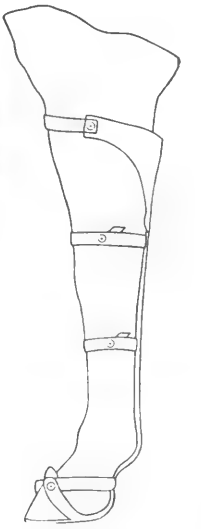
It is a well-established clinical fact that over-distention of muscular tissue produces temporary paralysis. When we consider that the mild forms of radial paralysis above mentioned as having been produced while animals were kept under restraint upon the operating table, with elbow extended but slightly—and the severe cases with the enormous extension and stretching of all the muscles attached to the olecranen and situated in the scapulo-humeral angle, which takes place every time the patient

attempts to place weight upon the affected limb—is it not reasonable to suppose that the very violent and often repeated and continued over-distention of these muscles is largely responsible for this persistent lameness?

I am of the opinion that in the milder forms of this disease the trunk of the radial nerve is rarely involved, and that the symptoms are due to an obstructed circulation from pressure or functional disturbances of the muscles from over-distention. In the severe forms, I have no doubt but that the nerve itself is



Merillat Method.



Iron Brace Illustrated in Merillat's Surgery.

primarly involved, and perhaps from over-distention or pressure due to accidental causes, has temporarily lost its function, producing paralysis of all the muscles it supplies; but I am convinced that the muscles while in a state of complete paralysis are subjected to enormous strains, frequently repeated, which temporarily destroy the contractile power of their fibres and cause persistent paralysis, secondary to and entirely independent of the primary injury to the nerve. Upon this theory the value of the brace as a remedial agent is readily explained.

I also believe that a somewhat similar condition exists in cases of so-called femoral paralysis and dropping of the stifle, following recovered cases of azoturia, and if a brace or some other apparatus could be devised which would keep the stifle in its place and rest the muscles in the anterior femoral region, satisfactory results would probably follow and shorten the period of convalescence.

Dr. Merillat, in describing his treatment of brachial paralysis, evidently recognizes the advantages of mechanically placing the affected limb in a vertical position. He shows a very neat-fitting iron brace, which is made to follow the curves of the leg. It is equipped with buckles and straps and is applied close to the limb. He also illustrates another very simple and original method of fixing the knee in brachial paralysis by the use of an ordinary saddle, back strap, crupper and breeching, and the knee of the affected leg is secured to the breeching and in this way kept in a proper vertical position.

This method looks practical and seems to possess many advantages over a brace, if it will keep the limb in the desired position in severe cases. I have not had a bad case since I saw the illustration, but shall certainly give it a trial at first chance.

Dr. Geo. M. Whitaker Dies Suddenly.—Dr. George Mason Whitaker, late of Washington, D. C., an associate editor of Hoard's Dairyman, died August 29 after an illness of but a few hours. At the time of his death, Dr. Whitaker was president of the Farmer's National Congress, and secretary of the National Dairy Union. He was for several years attached to the Dairy Division of the Department of Agriculture in Washington. He was a man of unusual culture. For fifteen years he was editor of the *New England Farmer*, and president, secretary, treasurer and trustee of more associations, agricultural boards and clubs than our limited space will permit us to enumerate. He was buried at his old home, Southbridge, Mass., where he was born in 1851. He was active mentally and physically up to the time of his death, and the sudden cutting off of his useful life, was a great wrench to his family and associates.

RESULTS WITH THE COMPLEMENT FIXATION TEST IN THE DIAGNOSIS OF CONTAGIOUS ABORTION OF CATTLE.*

F. B. Hadley, D.V.M. and B. A. Beach, D.V.M., University of Wisconsin, Madison.

Since the perfection of the complement fixation test for the diagnosis of syphilis and glanders, many other diseases have been made the subject of investigation by using the blood serum as a basis. Among these, perhaps none has a wider field of usefulness than the application of the test to the diagnosis of contagious or infectious abortion of cattle. This statement is made advisedly and with a full realization that exceptions may be taken. However, when the prevalence of the malady and the great number of animals that are subject to it are considered the above statement has more weight.

Contagious abortion is generally prevalent in all sections where dairying is engaged in, and has caused tremendous losses in certain pure bred herds in which conditions were favorable to the dissemination of the infection.

The disease is most frequently seen in the bovine species. It is caused by a specific microörganism which finds the pregnant uterus a particularly favorable location for growth; and is usually characterized by the expulsion of the fetus before the period of gestation has been completed.

The causal agent is known under various names. Of these *bacillus abortus* (Bang) seems to be the most universally accepted. The organism is a cocco-bacillus 0.8 to 2 microns long by 0.5 to 0.7 wide, stains with aniline dyes, and is Gram negative.

In growing the abortion bacilli blood-serum-agar has been found eminently satisfactory for a nutrient medium. A rarefied atmosphere has given better results than ordinary incubator air. The colonies are small, round, slightly convex, and smooth, simu-

*Read before the American Veterinary Medical Association, Indianapolis, August, 1912.

lating a honey-or-dew-drop. A characteristic bluish cast is observed by transmitted light.

The pregnant uterus is a particularly favorable location for the growth of the abortion bacilli. When present in large numbers they set up an inflammation which is perhaps most noticeable at the cotyledons. Finally the natural exchange of gases and nutrients between the mother and fetus can no longer take place, with the result that abortion or premature expulsion of the fetus occurs.

It does not appear necessary to enter into an exhaustive discussion of contagious abortion from the clinical viewpoint, consequently many interesting points to the practitioner will needs be omitted. Of particular interest may be mentioned the belief that occasionally infected cows may act as carriers of the abortion bacilli for many months after the last abortion, as do the so-called typhoid fever carriers of the human race.

Our work with this diagnostic method as applied to the disease under consideration was started in June, 1911, since which time a large number of animals from different parts of the state of Wisconsin have been tested.

For a full description of the technique of manipulation and components used in the complement fixation test reference may be had to Research Bulletin No. 24 of the Agricultural Experiment Station of the University of Wisconsin by the writers.

The test is strictly a laboratory procedure and is based upon the presence of certain specific antibodies or immune bodies which circulate in the blood of infected animals. These substances vary in quantity and quality, depending upon the period of infection. Their presence is determined by using guinea pig complement, a constituent of fresh blood, as an indicator. If the blood-serum sample under test is from an animal harboring the abortion bacilli a fixation of the complement takes place, leading to a definite and easily recognized test tube reaction. On the other hand, if no infection is present in the animal whose serum is being tested the complement will remain free to act in the dissolution of the red blood corpuscles.

Because it is impracticable in a paper of this kind to take up the different steps in the performance of the test, it will be assumed that most of you are familiar with them. We will therefore immediately proceed to the interpretation of the reaction, which may be summarized as follows:

1. Cattle in which the serum shows a complete fixation of the complement in quantities of 0.01 c.c. and 0.02 c.c. are or have been infected with abortion bacilli

2. Cattle in which the serum gives a complete complement fixation in the quantity of 0.02 c.c. and an incomplete fixation in the 0.01 c.c. amount also are or have been infected with the abortion bacilli.

3. Cattle in the serum of which no binding is noted in the 0.01 c.c. amount and an incomplete binding in the larger amount should be considered questionable reactors and retested after four or five weeks.

4. Cattle in which the serum shows no power of fixing the complement in either amount should be considered free from the infection.

A positive reaction, obtained in testing the serum from a pregnant cow or heifer, does not necessarily mean that the animal will abort. We have shown that abortion is simply incidental to infection. All animals have a certain amount of nonspecific physiological resistance, while many members of infected herds show an acquired active immunity which they have gained either from an attack of the disease or by a casual vaccination.

It must be understood that there may be a considerable variation in sera from different sources. In some the antibodies are not present in sufficient quantity to bind the complement, indicating that the animal in question has become infected recently, or that she is just recovering from the infection. In such a case a retest must be made in four to six weeks to determine positively what condition actually exists.

In order that a comparison might be made between the agglutination and the complement fixation tests when used as diagnostic agents for contagious abortion, a series of parallel tests

was carried out as per Table I, a glance at which reveals some discrepancy between the two methods of diagnosis:

Table I. Comparison of the Agglutination and Complement Fixation Tests.

Number of Animal.	Abortion Record.	Agglutination Test.	Complement Fixation Test.
1	Never aborted	—	—
2	Never aborted	—	—
3	Never aborted	—	—
4	Never aborted	+	—
5	Never aborted	—	—
6	Never aborted	—	—
7	Never aborted	—	—
8	Never aborted	+	—
9	Never aborted	—	—
10	Never aborted	—	—
11	Never aborted	—	—
12	Never aborted	—	—
13	Never aborted	—	—
14	Never aborted	—	—
15	Never aborted	—	—
16	Never aborted	—	—
17	Never aborted	—	—
18	Never aborted	—	—
19	Never aborted	—	?
20	Never aborted	+	+
21	Never aborted	—	—
22	Never aborted	+	+
23	Never aborted	+	+
24	Never aborted	—	—
25	Undoubtedly infected	+	+
26	Aborted twin calves	—	—
27	Vaccinated heifer	+	+
28	Vaccinated heifer	+	+
29	Vaccinated heifer	+	+
30	Vaccinated heifer	+	?
31	Aborted December 21, 1911	+	+
32	Aborted August 1, 1911	+	+
33	Probably aborted August, 1911	?	+
34	Never aborted	+	+
35	Aborted May 29, 1911	+	+
36	Vaccinated heifer	+	+
37	Calf of No. 34	+	+
38	Aborted February 19, 1911	—	+
39	Bull	?	+

(— sign indicates negative reaction; + sign indicates positive reaction; ? signifies an atypical reaction.)

It is interesting to note No. 26, a young cow that aborted twin calves at the fifth month of gestation. Both tests gave negative results, indicating other cause than infection for the abortion; three months later another complement fixation test also resulted negatively. Nos. 28, 29, 30 and 36 are experimental heifers under process of immunization by vaccination with attenuated cultures of abortion bacilli. They all gave evidence of the presence of the organisms by the tests, although they had never been bred. No. 37 is the calf of No. 34; at the age of 25 days and again at three months its serum showed evidence of the presence

of the specific immune bodies and agglutinins, a point of especial importance when considering the matter of inherited immunity. The dam harbored the abortion bacilli at parturition, as we demonstrated by recovering the organisms from portions of the placental cotyledons. More conclusive evidence was established by preparing, from the growths, an antigen which gave a typical binding when titrated against the serum from a known positive reactor. The bull, No. 39, had been used for service in an infected herd for some time, which accounts for the positive results with his serum.

These and other comparative tests in which clinical history has been much more closely corroborated by the complement binding reaction than by the agglutination test lead us to regard the former as greatly superior to the latter as a diagnostic means for contagious abortion. However, the additional evidence which the agglutination test brings to bear upon suspicious or atypical reactors is usually sufficient so that a definite diagnosis may be made. Accordingly, it is recommended in such cases for use in conjunction with the complement fixation method. When both tests give positive results we are safe in concluding that the animal is or has recently been infected. Other investigators report results which are in accord with the above statements.

Among other things, it is, of course, of utmost importance to know if this new complement fixation test is accurate when applied to the same animal at stated intervals. To establish this point, consecutive tests were made on a herd of infected cattle belonging to the Wisconsin Experiment Station. The animals were of various ages and breeds and were representative of a good dairy herd. The results of these tests are given in Table II, and are interesting, as a number of hitherto undemonstrated and important points relative to this disease are brought out, viz.:

1. The persistence of the immune bodies for more than a year after abortion occurred, *e. g.*, No. 3.

2. The fact that No. 5, a calf, did not show evidence of the immune bodies up to a year old, although she was dropped prematurely and was in constant association with infected animals.

3. Evidence that these bodies appear gradually, indicating that a certain degree of immunity results from infection and that there is a decided probability of artificially increasing the immunity by the administration of vaccines and bacterins.

Table II. Summary of Consecutive Tests in an Infected Herd.

No.	Abortion History	1911 July Test	1911 Oct. Test	1911 Dec. Test	1912 Jan. Test	1912 March Test	1912 April Test	1912 July Test
1	Calves April 29, 1911.....	+	+	— — —	+	+	— — —	— — —
2	Aborted August 1, 1911.....	+	+	+	+	+	+	+
3	Aborted February 19, 1911..	+	+	+	+	+	+	— — —
4	Aborted May 29, 1911.....	—	—	?	+	+	+	+
5	*Dropped March 10, 1911.....	—	—	—	—	?	—	+
6	Calved February 19, 1912....	—	?	?	+	+	+	+
7	Aborted December 21, 1911..	—	?	+	+	+	+	+
8	Probably aborted August, 1911	+	+	+	+	+	+	— — —
9	Aborted years ago.....	+	—	+	+	— — —	— — —	— — —
10	Bull	— — —	—	—	+	+	— — —	+

*Injected with abortus vaccine in April, May and June, 1912.
(— sign indicates negative reaction; + sign indicates positive reaction; ? denotes atypical reaction.)

The practical value of this new diagnostic method may be best brought out by giving a synopsis of the results obtained in the field. Samples of blood from various herds, whose owners wished to know definitely whether or not the contagious form of abortion existed, have been forwarded to our laboratory for examination. Sometimes full details concerning the history of each animal accompanied the samples. At other times absolutely no information was given. One veterinarian stated that he purposely omitted such assistance so as to avoid the possibility of influencing us by suggestions. When convenient, we have gone into the field ourselves to collect the serum samples, as by so doing we felt that more reliable data could be gathered. We realized that in new work of this nature too much care could not be observed if the results and conclusions were to be of scientific value.

*Table III. Summary of Results with the Complement Fixation Test in Infected Herds.**

Abortion History	No. of Animals	Reaction: Positive	Reaction: Negative	Reaction: Atypical	% Positive	% Negative	% Atypical
No history of abortion.....	350	69	267	14	19.7	76.3	4.0
Known aborters	118	99	17	2	83.9	14.4	1.7
Herd bulls	12	3	9	0	25.0	75.0	0.0
Totals	480	171	293	16	35.6	61.1	3.3

*A very few of these animals came from herds where no infection existed.

Of the 480 animals represented in Table III, 350 had no history of abortion, while 118 were known to have aborted, and the balance were herd bulls. Of the animals in these infected herds 69 or 19.7 per cent. showed evidence of abortion infection, although they had never aborted. Included in this number are certain cows whose history is unknown, and which undoubtedly had aborted some time in the past. But 83.9 per cent. of the cows which had been known to abort gave positive reactions. This apparent discrepancy is explained when attention is drawn to the fact that many of these animals aborted more than a year before the test was applied. It is assumed that the negative reactors in this group have lost whatever immunity they may have gained or their abortions were due to mechanical causes. The significance of the large number of negative reactions given by herd bulls should not be overlooked. Summarizing we find that out of the total 480 animals tested 171, or 35.6 per cent., gave evidences of infection and 293, or 61.1 per cent., were free from it.

When it is understood that practically all the animals represented in the above figures came from infected herds the percentage is not larger than should reasonably be expected.,

Experiments in attempting to eradicate contagious abortion from infected herds by using the complement fixation test as a means of detecting infected animals are well under way. Although not yet completed, the results so far obtained are very encouraging and indicate that this may result in an effective means of controlling contagious abortion. In one herd where the positive and negative reactors were separated and placed in different quarters with special attendants, after a period of four months no abortions had occurred among the first group of cows, while two premature births and four healthy calves had been dropped by the second group.

The question of immunity may be studied to the best advantage by the use of the complement binding reaction as a means of checking up results. Our attention was first directed toward the importance of this when large herds of cattle in which contagious abortion was known to exist were tested. It was ob-

served that a number of animals which had never aborted gave positive reaction. Some of these undoubtedly had become infected quite recently and even aborted subsequently. Others, however, were actively immune to abortion infection, although they had never aborted.

We are not yet fully prepared to state how effective is the immunity possessed by cows which have never aborted, but which give a positive reaction. Experiments now under way will materially assist in solving this very important and extremely practical problem.

This brings up the matter of actively immunizing cattle against contagious abortion by the administration of a vaccine or bacterin. So far, nothing at all reliable has been advanced as a treatment and the prospects of discovering a curative agent appear to be as remote as ever. Consequently, our aim must be to find an effective preventive. Vaccination may be the solution.

In conclusion, it may be said that the complement fixation as applied to contagious abortion is a delicate, specific reaction, which is as accurate as any biological test. It provides a trusty means by which infected animals may be detected, afterward proper methods of segregation may be carried out and the disease brought under control.

The test does not distinguish between animals which are harboring the active organisms and those which are immune. Practically this makes but little difference, for the infectious and immune animals can be isolated together with impunity.

Before closing, we desire to acknowledge the assistance given in the technique of manipulation by Dr. W. P. Larson, formerly associated with us, but now of the University of Minnesota. Through the kindness of Dr. Holth of the Royal Veterinary Laboratory at Copenhagen, who was one of the original workers in this field, Dr. Larson became familiar with the test. Further, we are indebted to the owners of the various dairy herds whose hearty coöperation has made this work possible.

The receipts and disbursements of the A. V. M. A. have reached the sum of $8,000 a year.

PREVALENCE OF GLANDERS, COMMON MODES OF DISSEMINATION, CONTROL AND ERADICATION.*

By J. G. Wills, B.S.A., D.V.M., Albany, N. Y.

Glanders or farcy is one of the most important infectious diseases of horses with which live-stock authorities have to contend at the present time. It has appeared in practically every portion of the civilized world, inhabited by the equine race. The disease is widely distributed upon the American continent, and at the present time there is no considerable section of the country where horses are found entirely free from occasional cases. The possible transmission of the disease to man adds to its importance from the standpoint of human as well as veterinary medicine.

The spread of glanders has been aided by promiscuous traffic in horses and mules, by the assemblances of large numbers of these animals in the execution of public enterprises, such as canal and highway building, by the collection of cavalry horses at army manoeuvres and similar gatherings, and in fact by the intermingling in various ways of infected animals with others capable of acquiring the disease. We are told by the older writers upon this subject that glanders has been noticed to have increased in prevalence after the close of the great wars, this being especially noted after our own Civil War, when it was carried to many districts previously free from it, by infected horses and mules from the armies of the North and South. Likewise the Mexican and Spanish-American wars aided in introducing the disease into Mexico, Cuba and adjacent islands.

Glanders is said to be unknown in some of the isolated countries, especially where efforts have been made to prevent its entrance; among the most notable examples of which are the islands of Australia, Iceland and New Zealand, the disease having been

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kept from gaining admittance by rigid quarantine, and careful veterinary inspection of all imported solipeds. In western United States and Canada the disease is more or less prevalent, but apparently not as much so as in the larger cities, and more thickly populated districts of the East, where conditions present more favorable opportunities for its spread.

The means by which glanders is distributed were until recent years little understood, and even at the present time there is a wide difference of opinion among scientific men in relation to many of these questions. It was formerly believed that the disease was disseminated directly from the infected to the healthy animal, later it was found that it followed contact of susceptible animals with contaminated objects occurring in stables in which glandered animals had been kept, and where disinfection had not been thorough. In this way the public watering trough, blacksmith shop, hitching stables and similar agencies have come to be considered as important communicating channels in localities where glanders is prevalent. Irresponsible horse dealers are also important mediums for the distribution of infected horses, and the wandering gypsy horse trader has always been credited, sometimes unjustly, with having carried the disease to localities where it was seldom, if ever, known previous to his visit. Owing to the character of the malady, the most careful physical examination by a skilled veterinarian does not prove of any great value in protecting against purchasing infected animals.

Veterinarians are also in some parts of the country to be held responsible to some extent for the increase in prevalence of the disease. This may sometimes be due to ignorance, or a positive indifference as professional men, to the welfare of the public. The fear of financial loss because of decrease in patronage may cause the unscrupulous practitioner to conceal from his client the true nature of the ailment, and may lead to the suggestion that the owner dispose of the diseased horse, which results in the infection being scattered and perpetuated. Treatment is sometimes suggested by such men in order to obtain the fee, when a more careful consideration of the case would show that such

a procedure was not only useless but dangerous. The concealment or disposal of known glandered animals by veterinarians and others, so that they may not come to the attention of proper health or sanitary officials, is a custom productive of many bad results and cannot be too severely censured.

The theory, formerly quite generally accepted, that only visibly glandered animals are dangerous is now doubted, although this is a much disputed question. It is possible, and indeed probable, that cases of pulmonary glanders and other internal forms of the disease could exist in such a stage of development as to allow the infecting virus to escape from the body of the host, and yet the animal be apparently healthy as far as physical appearance would indicate.

The investigations that have so far been made tend to show that glanders is most often contracted by the entrance of the organism into the alimentary tract of the healthy animal. Infection through the broken skin or respiratory mucous membrane is by no means unimportant, the latter being more common if there is exposure to particles upon which the germ might be carried. Inoculation through the skin or membranes other than those mentioned is comparatively uncommon and therefore not as important.

Since the bacterium mallei is strictly a parasitic organism, having no known habitat, except in the tissues of the infected host, it is evident that could the escape of the virus be prevented, the disease would disappear upon the death and proper disposal of the individuals now infected. While this is an attainment to be earnestly sought, its accomplishment presents almost insurmountable difficulties in glanders as in many other diseases. We are, therefore, confronted with the problem of determining when the virus escapes from an infected animal, and the means by which it reaches the tissues of the succeeding host. While there are many obscure carriers of the germ, it is quite obvious that the danger of infection is in quite direct proportion to the proximity of the susceptible animal to the spreader, whether it be by direct contact or through inanimate objects, such as water, food,

utensils or surfaces where the virus has been recently deposited. One of our greatest difficulties, therefore, is to determine when glandered animals become capable of distributing the infection, and how to detect the approach of that stage of disease. Although there are at the present time several specific procedures for the detection of glanders there seems to be none that can be entirely relied upon, or that is accepted as meeting all requirements. Of the common methods, mallein, the agglutination and complement-fixation tests seem to be the most satisfactory, although each has its advantages and limitations. No test seems to have yet been devised indicating in any positive way the extent of development of the disease in the living animal.

The control of glanders presents one of the most complicated problems with which the veterinarian has to deal. The greater prevalence of the disease in the city brings into consideration difficulties not encountered in the country. Among these may be mentioned closer contact on the streets, more crowded stables, undesirable sanitary conditions, animals handled by unskilled persons, having no pecuniary interest in the animal and many other conditions. On the other hand, more satisfactory methods of inspection and supervision can be put into effect in districts where horses are stabled in large numbers than where they are running at large upon the range, or kept upon widely separated farms where it is not possible or practicable to make as frequent examinations, and where veterinary assistance is not always easily available. Eradication of this disease where a large number of animals have been exposed, or may be infected, becomes from an economic point of view a matter of great difficulty, and the attitude of the owner of the animals must be considered when devising any method of control. In many instances, more satisfactory arrangements for supervision or control can be made with those who own large numbers of animals than is the case with the person who has only a small financial interest in live-stock and is disposed to resist interference.

In the control of glanders, one of the most perplexing questions is in reference to disposition of occult cases,—those ani-

mals in which diagnostic agents have indicated glanders. The fact that we are unable to determine how soon such animals become "spreaders," or what percentage of such cases will recover, leaves a most important problem unsolved. The large number of reacting, but apparently sound equines which would be found if all horses in certain districts were tested, makes it impracticable to destroy all such animals, as appropriations for the payment of indemnities to owners cannot in most states be obtained, and the confiscation and destruction of live-stock without payment of some compensation while it may be theoretically proper, in practice only results in dissatisfaction and opposition. Where but a small percentage of animals are found glandered, a radical method is to be advised, but the depletion of the equine population would be so great if such a plan were put in effect in our large cities that it is very doubtful if public sentiment would allow such a method to be carried to a successful conclusion, even if sufficient funds for so doing could be obtained. The reports of certain veterinary practitioners indicating that only a small percentage of occult glandered animals develop into clinical cases of the disease would, if correct, tend to show that proper supervision of such cases would be sufficient, and that slaughter would not be necessary, except in such as develop physical evidence of the disease.

Prognosis in reference to animals suffering from occult glanders is dependent upon so many influences, both internal and external, that accurate prediction as to the outcome in individual cases is impossible.

In some of our larger stables careful attention by a competent veterinarian, with the immediate destruction of all clinical cases of the disease, has apparently controlled the outbreak. It is probable, however, that by this method infected animals are still left in the stable and some of such arrested cases, if subjected to unfavorable conditions, might again develop active glanders and become sources of danger.

The possibility of successfully treating glanders has been widely discussed. There is no doubt that many horses become

infected, but never develop external evidence of the disease, or become dangerous to others. Some such cases apparently remain in the quiescent stage for years, but the lesions may become active should the vitality of the animal be lowered by other diseases, overexertion, unsanitary surroundings or any other debilitating influence. In other animals, because of the resistent forces in the body of the host or because of the virus being attenuated, the disease is confined to a small area and becomes sufficiently incapsulated to effectually prevent further increase of glanderous tissue, unless affected anew.

Our lack of experimental data as to what proportion of infected animals recover or progress to advanced glanders, makes it impossible at the present time to suggest any definite method in relation to the control of the disease. While we all have certain theories and opinions in relation to these points, yet when we attempt to prove our contention, we find that there is practically no authoritative data upon which to base our conclusions.

The tendency to consider animals as cured or healed when the disease is only arrested has resulted in much discussion and dissension among veterinarians and others who have studied this disease. It is very doubtful if an animal which has well developed glanderous lesions in its body can ever be considered permanently cured, in the strict sense of the term. If clinical evidence of the disease is ever shown, we believe that such animals should thereafter be considered as a menace to all susceptible species, and absolutely segregated or destroyed.

Glanders vaccine as a prophylactic and curative measure has been quite widely advocated. The results obtained have been, as far as we are able to learn, indefinite. The use of vaccine has contributed to the existing confusion in relation to glanders and because of its indiscriminate use often by incompetent men, and under unfavorable conditions, has been productive of more harm than good. The use of such products before their value has been determined by proper scientific experiments only tends to complicate the situation. Since the administration of glanders vaccine interferes more or less with the various tests for

glanders, its use should be prohibited, except under proper supervision, until such time as its value can be with certainty determined. It is desirable that we minimize as far as possible the opportunities for complications and mistakes by preventing the use of biologic products by the unskilled men. The development of modern methods of diagnosing glanders has placed in the hands of unscrupulous persons a means of detecting many occult cases of this disease, enabling such persons to arrange for disposition of suspicious animals, if they are so inclined.

All animals showing suspicious evidence of glanders should be brought to the attention of the proper health and sanitary officials, so that they may be kept under proper observation. The disposal of suspicious animals should be prohibited and a heavy penalty inflicted upon violators of such orders. The inspection of all equines passing from one state or province to another will evidently have to be required, and the movement of such animals, except when accompanied by certificate of health, prohibited. Thorough disinfection of premises where known glandered animals have been kept or harbored is essential, and neglect of this precaution has been a prolific means of infection in the past.

Our lack of scientific knowledge in relation to many of the points which have been touched upon here would seem to necessitate further investigation before we can determine upon a method of control of this disease that will be effective. Furthermore, it is very evident that a uniform scheme applicable to all conditions and to all sections of the country can hardly be possible, owing to the varying circumstances under which animals are stabled or harbored, the difference in climatic conditions and many other influences beyond the control of man.

There are in our opinion four important questions to be considered and at least partially solved before we can expect to make any great advances in the control or eradication of glanders:

1st—The development of an accurate method of diagnosis adapted to general use.

2nd—Some positive knowledge as to the relative danger from occult, but known glandered animals, as compared with those showing physical evidences of the disease.

3rd—More definite information as to the efficiency of glanders vaccine, which is credited by some with having certain immunizing or curative properties.

4th—More conscientious and better trained veterinarians, who will more carefully consider the interests of their clients, and by so doing assist in protecting against losses from infectious diseases.

In the foregoing paper we have endeavored to point out some of the difficulties which have seemed most important, and have refrained from attempting to suggest definite methods of control of glanders. By referring to a few phases of the subject, we hope to have prepared the way for a further consideration of the disease by the experts here assembled, believing that more knowledge will be gained in discussing the situation than is possible by placing before you the opinions and views of one observer.

The Lake Erie Veterinary Medical Association will hold its next regular business meeting at Lorain, Ohio, October 8, and Secretary Fulstow desires to see a full attendance.

A Favorable Comparison of Statistics.—There are today about 800,000 automobile registrations in this country, of which about 20,000 relate to trucks and delivery wagons. Against these totals it is recalled that there are approximately 21,000,000 horses in the United States, that about 7,000,000 horse-drawn vehicles are in daily use and that American manufacturers are still producing yearly some 1,750,000 more.

In view of these facts it cannot be said that the horse is as yet "passed." It is also a fact that while the cost of horses and horse feed has been constantly advancing the prices of automobiles and motor vehicles, gasoline and electricity have been steadily on the decline * * *.—(Extract from *Rider and Driver*).

GLANDERS VACCINE.*

By Robert S. MacKellar, V.S., New York, N. Y.

The use of glanders vaccine as an immunizing agent was first begun in New York City during the summer of 1907.

In a paper entitled "The Diagnosis of Glanders in the Human Subject from the Viewpoint of a Veterinarian," by Dr. A. Silkman, Veterinarian, New York City Department of Health, read at the February meeting of the Veterinary Medical Association of New York City and subsequently published in the American Veterinary Review of June, 1907, also in the *Medical Record* of October 5, 1907, Dr. Silkman advocates that a special preparation of mallein might be of assistance in combating the dread scourge of glanders.

Working along these lines, with the assistance of the Research Laboratory, Department of Health, New York City, a glanders vaccine was prepared in the following way:

Bacillus mallei is inoculated upon 3 glycerin potato agar tubes, and allowed to grow at incubator temperature (37° C.) for 24 hours. To each tube is then added 2 c.c. of sterile, physiological salt solution, and the surface growth is made into a suspension by rubbing up with the salt solution by means of a strong platinum wire. The suspension from the three tubes is added to a flask containing 500 c.c. of sterile nutrient broth. The inoculated flask is incubated for 72 hours. At the end of this time the flask is removed from the incubator and the culture is tested for purity. If a pure culture, the flask is placed in a water bath and gradually brought up to 70° C., and held at that temperature for two hours. After the heating is completed and the material is tested for sterility by making inoculations upon glycerin potato agar, and incubating at 37° C. for about 48 hours. If sterile, add 50 c.c. of a 5 per cent. solution

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of carbolic acid to the 500 c.c. of the vaccine to prevent infection. Then the vaccine is ready for bottling. The bacterial count is 100,000,000 bacteria per c.c.

This vaccine is inoculated subcutaneously in three separated doses, a week apart, under aseptic precautions, viz.: clipping the hair and washing point of inoculation with a 5 per cent. carbolic or a 1-1,000 bichloride solution.

The first injection consists of 1 c.c., the second 2½ c.c., and the third 5 c.c. of the vaccine.

In some animals a marked thermic and local reaction occurs, lasting for several days. The local reaction in these cases is usually a large edematous swelling, which in a few instances has exuded a serious exudate. These cases however are rare, and it has been our experience that not over 1 or 2 per cent. of the animals inoculated are incapacitated for continuing their regular work.

The first stable in which we applied the vaccine was one containing 150 head of draught animals. Glanders developed in this stable and fourteen head were condemned and destroyed on physical symptoms and the mallein test.

The agglutination test of the remaining 136 head resulted in 77, showing a reading of 1,000 and up to 10,000.

The vaccine was then administered with the result that two or three animals very soon, after the first injection, developed a negative phase, and presented physical symptoms of glanders and were destroyed. We find that where the glanders lesions are in an advanced stage the use of the vaccine will produce negative phase, followed quickly by development of physical symptoms.

The animals remaining in this stable were subjected to the vaccine treatment six months later, and again in six months from the second treatment. None of these animals treated in this manner have developed glanders up to the present time.

A gray gelding recently purchased from another firm in June of this year (1912) developed a clinical case of glanders and was destroyed. The owners of this establishment were so

favorably impressed with the previous result of the vaccine treatment that they requested it be used again.

This was immediately done during the month of July and up to the present time no further cases have developed. In another large brewery stable fourteen head of horses were destroyed on physical symptoms, and the mallein test during the winter of 1907-1908. Eighty-one horses were subjected to the agglutination test and forty-nine gave a reading of 1,000 and up to 10,000.

At this time the proprietors requested that a consultation be held, which was done, and consisted of the attending veterinarians, the Department of Health veterinarian and two prominent practitioners of New York City. Each and every animal was given a rigid physical examination and at the suggestion of the consulting veterinarians a few showing slight physical symptoms were quarantined in a small stable set aside for that purpose. All of the animals were given the vaccine as in the first stable mentioned above, with results very similar. Three "breaking down" after the first or second injection of the vaccine.

Among those quarantined a pair of roan geldings proved to be very interesting cases. On physical examination the submaxillary glands were found to be very much enlarged, and several of the lymphatics prominent and carrying a temperature prohibitive of the mallein test. The agglutination reading of each was 10,000. These animals were carefully watched and in addition to their regular doses of vaccine were given seven additional doses of 5 c.c. at regular intervals. Their temperature ranged from 100° to 106° F. for over three months, when it finally became normal.

They were kept in quarantine for about eight months, at the end of which time all symptoms having abated they were returned to the main stable. These two geldings are alive and performing their regular work at the present time, after a period of four years.

This stable was also re-inoculated six months later, and the

results have been very satisfactory. Not a single case has developed since. In another stable of seventy head an outbreak occurred which resulted in the loss of several animals and worse than all the death of the veterinarian who was there in attendance and contracted the disease.

The same methods were pursued in this stable as in the two previously mentioned, with a result that not a case has developed in nearly four years.

This course has been pursued in a large number of other stables, and in nearly all instances with gratifying results. The above cited cases will tend to give an idea of the method of procedure.

In animals giving a pronounced thermic and local reaction we have found it advisable to make a few additional injections of the vaccine until a permanent positive phase has been established.

The general improvement in the physical condition of animals after the vaccine treatment is decidedly marked. The coat becomes smooth, and they as a rule gain in weight. One owner remarked "that it acted better than any tonic powder he had ever used."

It is undoubtedly true that a horse may give a positive agglutination reading and still not give a mallein reaction. We believe this also to be true of the complement fixation test. This seems to be due to the fact that the glanders bacilli is present in the system but no active lesions. The question now comes up, "Has the horse enough natural immunity to overcome the infection?" By the use of the glanders vaccine the opsinins are increased and aided in overcoming the infection. Just what action the vaccine has on the blood is not known except that it increases the opsinins and anti-bodies.

Mallein itself will give a small amount of immunization but nothing to compare with the vaccine containing the dead organisms.

The question has been raised, viz.: "If a horse was vaccinated with glanders vaccine in New York City and said horse

be shipped to Philadelphia, and should there show symptoms of glanders, and the owner would send a sample of the blood to any laboratory to be tested by the agglutination method or the complement fixation test, what would happen?"

In answer to this, we quote Dr. A. Silkman who states that: "Personally I would say that a certificate should go with the horse stating that he had been vaccinated, the date, and by whom. The vaccine will undoubtedly interfere with either of the above tests. The mallein test would be the only one to rely on. Some claim that a horse will give a mallein reaction after the use of vaccine. This has not been my experience. The horse having received as high as 30 c.c. of glanders vaccine, as a dose, did not give any mallein reaction."

The post mortem findings in horses following the use of vaccine are quite interesting. There is quite a marked change in the appearance of the lesions and it also appeared that they were becoming encapsulated.

Quoting from the last report of the New York State Veterinary College in reference to glanders it is stated that "this disease seems to be spreading quite rapidly in the state. The steady increase in the spread of glanders should be a warning to all veterinarians who should be constantly on their guard for this most serious of diseases of the horse kind."

This indicates that the methods of control and eradication, which now obtain, are insufficient to even prevent the spread of the disease, far less its extermination. It would therefore appear that some measures such as have been recited in this article may and probably without any doubt would help to change this to be regretted condition.

During February, 1911, Dr. A. Silkman under the direction of Dr. William H. Park, Director of Research Laboratory, New York City, started a horse on glanders vaccine in an effort to produce a highly immunizing serum. The results up to the present time have been highly gratifying.

Any veterinarian desiring the vaccine to give it a trial can have it by sending his name and address to Dr. W. H. Park,

Director of Laboratories, Department of Health, New York City (foot of East 16th street).

It may not be within the province of this article to suggest any other methods for the control of glanders, but we cannot refrain from expressing the opinion that if a more extended inspection of all stables, especially those in the large cities, were made, all diseased animals promptly destroyed, quarantine stables established where those of a doubtful nature could be safely kept, and all others minimized by the use of glanders vaccine, it would soon result in the control and ultimate eradication of this scourge.

THE HUMANE TREATMENT OF ANIMALS is taught by Edward H. Packard of Massachusetts by a moving picture campaign. Mr. Packard has accumulated a number of pictures showing needless suffering of animals, which he is placing in the moving picture houses throughout the state. Mr. Packard is the field agent of the Massachusetts Society for the Prevention of Cruelty to Animals.

THE HORSE BREEDING INDUSTRY IN NEW YORK STATE has been receiving considerable attention from Commissioner Huson during the past year, and we are looking forward to a marked improvement in that direction in the near future. The commissioner fully appreciates the dearth of suitable horses in that state, for farm work and other business purposes, and he also fully appreciates the fact that New York State is eminently suitable for the production of that class of horses, just as much so, as for the production of the trotting horse, for which it has long been famous; he has been investigating the matter of horse breeding pretty thoroughly, and has no doubt formulated plans for the economical improvement and production of the work horse in that state, which will prove of great value to those engaged in agricultural pursuits.

QUARANTINE AND DISINFECTION IN CONNECTION WITH OUTBREAKS OF GLANDERS.*

By George W. Pope, D.V.S., Washington, D. C.

The necessity for imposing a lengthy quarantine upon stables in which the infection of glanders has appeared has of late years been obviated as a result of modern methods for diagnosing the disease.

Some of the older members of our profession will remember when we were handicapped in this respect. For instance, in the State of Illinois some twenty years ago the appearance of glanders in a stable resulted in the slaughter of animals exhibiting clinical evidence of the disease and the establishment of a ninety days' quarantine, with frequent inspections of all horse stock in the stable during such period.

Such prolonged quarantine and repeated inspection was annoying to the owner and, while at that time the best known method of handling the disease, served but poorly for the eradication of same from an infected stable.

Later came the mallein test, not an infallible method of diagnosis, but one which enabled the practitioner to remove many affected animals which would not be discovered by physical examination.

Following was the application of the serum agglutination and precipitation reactions and still more recently we have been favored with the adaptation of the complement fixation test in the diagnosis of this disease, this probably being the best method for the determination of the presence of glanders which we have at our command at the present time.

Thus with our present methods of diagnosis a long and tiresome quarantine is not required.

However, the establishment of a quarantine and the question

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of the same being close or modified will depend largely upon the authority vested in the sanitary officer by law.

In view of the ready means now at hand for determining the presence of the disease, it is doubtful if other than a provisional quarantine is necessary in these cases, and while it is not possible to prescribe any hard and fast rule which will govern in all instances, much depending upon circumstances and extent of authority, the following is suggested as a method that can be very generally adopted and which, while imposing upon the owner the least possible inconvenience, should yield satisfactory results in the eradication of the disease.

Such methods consists in the establishment of a provisional quarantine either prior or subsequent to the removal of all animals which upon physical examination have been condemned as affected with the disease.

The owner need not be prohibited from using the remaining animals provided they are entirely free from any evidence of the affection.

Certain restrictions, however, should be imposed including the closing of the stable water trough and the providing of a water bucket for each individual horse, the same to be used both in the stable and on the road.

Brushes and curry combs should either be immediately destroyed or thoroughly disinfected. The stalls vacated by condemned horses should be closed. Outside horse stock should not be permitted to enter the stable and the provisionally quarantined animals should likewise be prohibited from entering any stable other than their own, to feed at any public rack or drink from any watering trough whatsoever.

Having established such precautionary quarantine, immediate measures should be taken to secure blood samples from all horses in the infected stable for the purpose of submitting the same to the complement-fixation test.

The taking of blood and test of same will consume but a few days, this, however, depending somewhat upon distance from the laboratory to which the material is forwarded.

After removing and destroying all animals proven by such test to be affected, the stable, together with utensils, harness, etc., should be thoroughly disinfected.

Three weeks from the date of above test, blood samples should be taken and a second test made in order to determine whether or not any of the remaining animals have developed the disease during the interval between tests, this being a possibility in certain cases as a result of previous heavy exposure.

Should there be no reactions to such test the quarantine may be raised. Likewise should one or more horses prove infected as a result of this second test it will probably be evident upon post mortem that the disease was of very recent origin, and under such circumstances it will not be necessary to give the entire stable a second disinfection but that immediate portion of the building which has been occupied by the reacting horses should be thoroughly disinfected, after which the stable may be given a clean bill of health.

Disinfection.

In connection with the work of disinfecting a contaminated stable there are three essentials:

First—A preparation of the building that will facilitate reaching the organisms of disease.

Second—A disinfectant which upon contact can be depended upon to destroy such organisms.

Third—A method of applying the disinfectant that will assure the most thorough contact with the bacteria.

Before beginning the use of a disinfectant it is essential that certain preliminary work be done in and about the stable that is to be treated. The various surfaces, such as ceiling, walls, partitions, floors, etc., should be swept until free from cobwebs and dust. Any accumulation of filth should be removed by scraping and scrubbing with hot water and washing soda. In some cases the woodwork may have become softened and so porous as to be a good medium for the absorption of disease germs. Such woodwork should be removed, burned, and replaced with new material.

All refuse, manure, etc., from stable and stable yard should be removed to a place inaccessible to live stock and, if possible, be burned or thoroughly mixed with a solution of chloride of lime in the proportion of six ounces to one gallon of water. If the floor is of earth, it will doubtless have become stained with urine and contaminated to a depth of several inches. In such cases four inches or more of the surface soil should be removed and treated as above suggested for refuse and excreta. All earth removed should be replaced with soil from an uncontaminated source, or, better, a new floor of concrete may be laid, this being the most durable and sanitary material for the purpose.

Having made ready the field of operation, the next consideration should be the selection and preparation of the disinfectant.

The fact must not be overlooked that many agents used for the destruction of bacteria are likewise poisonous to animals and man. In fact, some drugs, although powerful as germicides, are so poisonous as to preclude their general use in the work of disinfection. Among such is bichloride of mercury, which posseses the power of destroying not only bacteria, but spores as well.

But while possessing great germicidal power in a solution of 1 to 500 or 1 to 1,000 and having the advantage of low cost and of leaving no odor in the stable, bichloride of mercury has the disadvantages of being a violent poison, of corroding metals and of uniting with albuminous substances, such as excreta, blood, etc., and thus forming inert compounds.

Thus care should be exercised in the selection of the disinfectant, and an agent should be selected having a known germicidal strength, properties of solubility, and at the same time possessing a reasonable degree of safety to animals and man.

All things considered, it is probable that some of the coal-tar products best fulfill these requirements. In this class is the compound solution of cresol, a preparation recognized by the United States Pharmacopeia and known as liquor cresolis compositus (U. S. P.). This preparation mixes readily with water and will prove a very efficient disinfectant. It should be used in the proportion of four or five ounces to each gallon of water.

Another favorable agent is cresol (commercially known as liquid carbolic acid). It is not as soluble as liquor cresolis compositus and should be thoroughly stirred during the process of mixing, which will be facilitated by using hot water. It is advisable to secure a grade of drug with a guaranty of 95 per cent. pure, and such should be used in the proportion of two or three ounces to a gallon of water.

As an accessory preparation and for use after the application of the disinfectant it may be advisable to make ready a lime wash to each gallon of which there has been added four ounces of chloride of lime, or, if it appears desirable to use the disinfectant and lime wash at one application, the following method may be followed in preparing five gallons:

Slake seven and one-half pounds of lime, using hot water if necessary to start action. Mix it to a creamy consistency with water. Stir in 15 fluid ounces of cresol (commercially known as liquid carbolic acid) at least 95 per cent. pure, and make up to 5 gallons by adding water. In case compound solution of cresol (liquor cresolis compositus) is used, add 30 fluid ounces instead of 15 as in the case of cresol (liquid carbolic acid). Stir thoroughly. If to be applied through a spray nozzle, strain through a wire sieve. Stir frequently when applying and keep covered when not in use.

The entire interior of the stable should be saturated with the disinfectant and special attention should be given to the feeding troughs and drains.

If a good spray pump is used and the operator uses care to cover the entire surface and drive the disinfectant into every crack and crevice, he may be reasonably certain that he has destroyed any organisms of glanders which may have been present.

Dr. James T. Shannon, junior member of the firm of Bryan and Shannon, Lexington, Ky., has retired from the firm, but will continue to practise veterinary medicine.

ANTHRAX OF ANIMALS IN PANAMA, WITH A NOTE ON ITS PROBABLE MODE OF TRANSMISSION BY BUZZARDS.*

By Drs. S. T. Darling and L. B. Bates.

In presenting these notes, we are pleased to be able to state that very few cases of anthrax in animals have been brought to our attention during the past seven years. One was a cow from a dairy at Empire, C. Z., and the other a hog from the Panama abattoir.

On account of the infrequency with which anthrax has been encountered here we believe that the † territory from which Panama obtains cattle and hogs is almost entirely free from anthrax. It is understood that there is no importation of cattle into the Republic at present and this no doubt favors the relative immunity from disease among the herds nearby.

From conversations with local cattle men it would appear that anthrax has been rife in the Republic in the past, and pastures on the Sabanas just outside the city of Panama have been infected with the disease. Not only so, but occasionally the sick cattle were hurriedly butchered and the meat sold at reduced prices to the very poor by whom it was consumed.

Meat inspection at the Panama abattoir at the present time is a satisfactory one, for the local inspector is a veterinarian, and in addition to his familiarity with diseases of cattle, he takes advantage of the facilities offered by our laboratory for the bacteriological and histological examination of material from suspected animals, and we are indebted to him for the material obtained from the case of anthrax of the hog reported here.

On April 1, 1911, an autopsy was held by one of us on a cow that had died at Empire at one of the dairies.

*Read before the Canal Zone Medical Association, August 14, 1912. From the Board of Health Laboratory, Ancon Hospital, Ancon, Canal Zone.

†The beef slaughtered in the local abattoirs is used almost exclusively by the native and West Indian population. Commission employees are supplied with cold storage beef from the United States.

The cow had been milked in the morning and was being driven along a path to the pasture when she fell. She was helped up, walked a few feet further and then fell again. Respirations became labored and the animal died in a few minutes.

The autopsy was held four and one-half hours after death. The udder contained milk and appeared normal. There were a few patches of broncho-pneumonia along the margins of the left lung. The heart contained a few epicardial petechiæ, but the muscle appeared normal. Cultures were taken from the left ventricle. The spleen was greatly enlarged and weighed about ten pounds. There were no capsular hemorrhages, but the pulp was tremendously diffluent and bulged above the cut surface. The liver was very moist on section. The borders were a brown color, and the branches of the portal vein were surrounded by parenchyma of a dirty light gray color, marking out a peculiar arborescence of necrosis. The mesenteric and post-peritoneal lymph nodes were enlarged and blood-stained. The gall bladder was full of pale clear fluid bile. The kidneys and bladder appeared normal.

Smears from the liver and spleen contained myriads of large Gram-positive bacilli, resembling anthrax bacilli. The Löffler's stained preparations presented a slight halo or capsule around each bacillus. The Hasting's preparations stained diffusely dark purple. No spores were detected in the smears from tissue. Cultures from Heart's blood into broth, blood serum and agar gave a pure culture of *B. anthracis*, which when placed out and subinoculated into media and guinea pigs, presented all the characteristics of this organism.

Sections of tissue from spleen, liver, udder and a lymph node contained enormous numbers of anthrax bacilli.

At the conclusion of the autopsy the carcass was covered with coal tar disinfectant and immediately burned.

Before the autopsy was begun, buzzards had appeared on the scene and had partly torn out the eyes.

The sale of milk was interdicted, the herd was visited at frequent intervals and temperatures of a number of the animals

taken, but no secondary cases were detected in the herd. It is believed that the infected cow was one that had been recently added to the herd from a neighboring village in the neighborhood of Chorrera, where it is known anthrax had made its appearance in the past.

The local abattoir at Empire has been very carefully and regularly inspected, but nothing suggestive of anthrax has been detected among any of the animals slaughtered there.

The case of anthrax of the hog is of unusual interest, for in the first place it is an example of this disease in an animal relatively insusceptible to it, in which the cervical lymph nodes alone were involved, and secondly, it affords what appears to be an excellent illustration of true bacterial symbiosis. According to Friedberger and Fröhner (*Friedberger and Fröhner, Veterinary Pathology, 6th Edition, Hurst & Blackett, London,* 1908, *Vol. II., page* 560) "cases of spontaneous anthrax in pigs are rare * * * pigs are more or less immune to anthrax which can be transmitted to them only with great difficulty." The inoculation experiments of many investigators have been followed by negative results. The literature on this subject would indicate that the commonest form of anthrax among hogs is the result of their eating infected flesh, and the disease presents itself as an angina characterized by edema and hemorrhagic necrosis and infiltration of the pharynx. Associated with this is hemorrhagic necrosis of cervical lymph nodes. "McFadyean has reported an outbreak of anthrax in which about 14 pigs were attacked with anthrax, probably from eating the flesh of an anthrax-stricken heifer. In all of these pigs the most prominent symptom was swelling in the region of the throat. McFadyean states that swelling of the throat in the course of an attack of acute illness is in the pig almost pathognomic of anthrax."

On February 5, 1912, Dr. Bosch, Inspector of Abattoir, City of Panama, brought to the laboratory a mass of encapsulated glands taken from the anterior aspect of a hog's neck. This hog was one of a herd brought from the interior of the Republic and one or two others had the same lesion similarly located. Dr.

Clark made smears from the cut surface of the glands and found them to contain an abundance of micrococci occurring in clusters and a few large square-ended Gram-positive bacilli which stained interruptedly and presented a halo resembling a capsule. The cut surface resembles a lymph node with interlacing lines of diffuse hemorrhage and caseous necrosis.

In frozen and paraffine sections, the tissue was seen to be made up of lymph nodes, the seat of extensive hemorrhagic edema, necrosis and leucocytic infiltration involving the nodes and surrounding tissue. Many anthrax bacilli were detected in the sections, particularly in the loose lymphoid tissue, while in the areas of necrosis enormous numbers of micrococci were associated with them.

Smears from one of the glands taken from bacteriological examination contained many small Gram-positive diplococci and occasionally large square-ended Gram-positive bacilli, a few of which contained equatorial spores. The bacillus presented the cultural characteristics of *B. anthracis,* and was pathogenic to guinea pigs. The diplococcus measured about one mu. in diameter. It stained readily with the anilin dyes and was Gram positive. No capsule could be detected. It was nonmotile. Gelatin stab cultures were not liquefied and the growth was filiform. On agar plates the colonies were punctiform, convex, and the internal structure was grumose in the centre and strongly refractive. The edges were entire and the optical character might be classified as sebaceous. The growth on potato was invisible at the end of 18 hours, and on agar slants the colonies were round and tiny like a streptococcus. There was no apparent growth in broth, but milk was decolorized in 18 hours, became strongly acid in 72 hours and was coagulated on the fourth day. Gelatin was not liquefied. In dextrose, lactose, saccharose, galactose, mannite, and dextrine semi-solid, acid was formed, but no gas. In dulcite semi-solid there was neither gas nor acid. The microorganism did not survive but a few days on media and it was not pathogenic for guinea pigs.

Taking into consideration the insusceptibility of hogs to an-

thrax, together with an examination of the lymph nodes in our case, we are of the opinion that the infected glands illustrate bacterial symbiosis, and that in all likelihood the diplococcus which was present in by far the greater numbers prepared the field in the lymph nodes for the limited activities of the anthrax bacilli.

Our observation that buzzards had flocked to the carcass of the cow and that they had begun to feed upon it led to further observations on the habits of these birds when eating carrion. They congregate about a dying animal, plucking out the eyes and tearing off soft parts even before death. Thus they pick away the mucosa of the anterior nares, pluck out the eyes and the soft parts around the anus and sheath. As decomposition advances and the tissues soften, the birds crowd into and upon the carcass, literally smearing the decomposed material over their plumage. In the case of an animal dying of anthrax, the tissues contain enormous numbers of bacilli. These in contact with air on the plumage of the bird go into spore formation, and buzzards most certainly act as carriers of infection, by transporting anthrax bacilli and spores from one place to another in this way. Some personal (immediate) contact with animals or pastures would be necessary in this case for infection. If, however, the spores of anthrax bacilli pass intact through the intestinal tract of buzzards, pastures might be infected from the droppings of birds that had fed on animals dying of anthrax.

The following experiments were carried out to determine the likelihood of that possibility. Three turkey buzzards were selected from a lot supplied through the kindness of the Health Officer, Panama, and the Sanitary Inspector at Empire. The buzzards were kept in an isolated room and were given a plentiful supply of drinking water and chopped meat. This meat was thoroughly soaked and mixed with a saline emulsion of anthrax bacilli and spores grown on agar plates. On account of the filthy habits of the birds, it was impracticable to obtain specimens of feces in which food contamination could be ruled out except by holding the birds and inserting a swab or catheter into the cloaca. Abundant material was obtained in this way. Specimens were

taken at approximately 12, 36, 60 and 84 hours after feeding. Numerous agar plates were immediately made, but in none was the anthrax bacillus present.

In order to introduce a maximum number of the bacilli, the experiment was repeated with the following variation: Instead of mixing food and cultures a rubber catheter was introduced into the gullet of the buzzard and about 20 c.c. of a very heavy saline emulsion of anthrax bacilli and spores were injected through a catheter into the stomach by a Luer syringe. The buzzards were watched to see that they did not regurgitate or otherwise unlawfully dispose of the dose. Agar plates were made as before, and anthrax bacilli were found to be absent. Shortly after these experiments were completed the birds were killed and cultures taken from various portions of the intestinal tract. Anthrax bacilli were absent.

We conclude from this experiment that pastures and other locations cannot be infected by buzzards through the agency of droppings, but require more intimate contact.

The experiment just outlined illustrates the very powerful digestive mechanism of buzzards for bacteria, and when we consider that the food of carrion birds is sometimes almost wholly bacteria and bacterial products, we are not surprised at the facility with which they appear to destroy all bacterial species. On the other hand they do not appear to be proof against Thallophytes, for most of the buzzards retained under observation and not used in the above experiment died of intestinal and peritoneal aspergillosis.

Dr. Fred F. Bushnell, formerly of Middletown, Connecticut, moved to Harvard, Ill., in the early part of the past summer.

Looking Forward for Each New Issue.—Dr. George A. Scott, Waterloo, Iowa, says in renewing his subscription to the Review: "I cannot be without it; after reading it for more than fifteen years, it seems like an old companion, and I am always looking forward for each new issue."

ANTHRAX VACCINE.*

By Chas. H. Higgins, B.S., D.V.S., F.R.M.S., Pathologist Dominion Department of Agriculture, Ottawa, Can.

The use of anthrax vaccine has been attended with varying results, some of which have been of a very unenviable character. Since the first demonstration by Pasteur in 1881 and 1882 the vaccine prepared at the Pasteur Institute in Paris has given universal satisfaction, and untoward results have been practically nil when their instructions have been followed to the letter.

My interest in anthrax vaccine has extended over a period of twelve years and at the outset was very discouraging. Using commercial vaccine Dr. Hargrave of Medicine Hat, Alberta, and myself had the misfortune to see five hundred sheep in a band of fifteen hundred fat wethers develop the disease and die after ordinary precautions had resulted in the checking of losses from the naturally contracted disease on an infected range. Subsequently it was found that this vaccine was contaminated as well as being of too high a virulence.

Others here present have probably experienced some difficulty with this vaccine or have learned of serious losses directly attributable to the vaccine and it is my endeavor to throw some light on points relative to its preparation and use which will tend to reduce these undesirable factors to the minimum.

The original vaccine of Pasteur was put up in liquid form and if we can give credence to some of the tradition surrounding its preparation it was purposely contaminated with the bacillus subtilis or the Hay bacillus in order to disguise its true character and render futile attempts to cultivate it from the original. Both organisms, being spore bearing, could live almost indefinitely side by side, yet would puzzle the bacteriologist attempting to grow the vaccine, particularly at that time, owing to the fact that solid media were not then in general use. To Koch

*Presented to the forty-ninth annual convention of the American Veterinary Medical Association at Indianapolis, August, 1912.

I believe belongs the credit of using a solid medium for the growth of this vaccine as originally prepared. He was also able to suggest that the bacillus subtilis was added in an endeavor to baffle the true nature of the virus.

There are various factors which may occasion untoward results when using a liquid anthrax vaccine. We may have a pure culture of too high a virulence—the first vaccine may not offer protection sufficient for the second; there may be a contamination or, the methods of administration may be faulty and introduce with the vaccine an infecting agent which so lowers the natural resistance of the animal that the vaccine increases in virulence at the site of inoculation, leading to an infection and a subsequent outbreak. The latter lies wholly within the province of the administrator of the vaccine and should be guarded against by him at the time of vaccination. The use of culture having too high a virulence or a first vaccine which is greatly attenuated are controlled by the man who prepares the vaccine. He is responsible for such errors and should so arrange his system as to make them practically impossible.

There is an error for which he is not responsible, however, and this may occur at any time with the liquid vaccines as placed on the market. This is the settling of the bacilli to some dependent point in the tube owing to the fact that the anthrax spores are of a greater specific gravity than the liquid in which they are dispensed. I have had tubes in which the bacilli would settle to some point and it would be impossible to get them into suspension. This is particularly the case when sealed glass ampules are used and the gravitation has taken place to the pointed end. In such cases, unless great care is taken the potent portion of the vaccine is broken off with the end of the ampoule and your animal gets the culture fluid with little or no vaccine.

When the foregoing accident happens with the first vaccine it is easily seen that we have not introduced a sufficient amount to protect the animal against the second or stronger vaccine. If the first is properly administered and the accident happens with the second vaccine we have an incomplete protection and a false

sense of security that our operations will be effective in protecting the animals concerned.

Another feature in connection with the liquid vaccine which concerns the laboratory worker only, is, the difficulty in preparation and meeting emergencies when a large amount of vaccine is required. Where liquid vaccines are dispensed by the laboratory it is necessary to have cultures of the first and second vaccines not over a week old. Older cultures may give satisfactory results, but, with the danger of contamination existing and the possibility of varying factors or accidents increasing the virulence of the attenuation, there is a constant risk in such methods. Liquid vaccines cannot be tested except bacteriologically, for every disbursement, hence, there is this constant uncertainty. When cultures must be prepared every week the detail is usually delegated to some laboratory subordinate who should never be trusted with such work.

Having had experience with the various features connected with the use in the field of anthrax vaccine and later being charged with the responsibility of maintaining the potency of the anthrax vaccine disbursed by the Dominion Government, I conducted various experiments to determine the possibility of using some method other than the liquid culture for the attenuated virus. The preliminary experiments which extended over a period of a year were successful and resulted in the use of a package previously designed for the disbursement of black-leg vaccine.

Properly attenuated organisms were dried on braided silk and experiments conducted to determine their protective power. For this work sheep were used. The sheep were tagged and the first vaccine administered. Twelve days were allowed to lapse between the administration of the first and the second vaccines, and a further period of twelve days was allowed between the time of administration of the second vaccine and virulent anthrax. To a "control" sheep inoculation with a thread of virulent anthrax resulted in death within forty-eight hours, while all vaccinated sheep remained healthy. In these experiments it was determined that the size of the dose of vaccine does not bear a direct

relationship to protection. The administration of a single thread of each vaccine gave an efficient protection against a thread impregnated with virulent anthrax. Six threads of each also conferred an immunity, yet did not result in a severe systemic disturbance.

Anthrax vaccine has been disbursed by us on a dry silk cord for a period of five years, and has been used on horses, cattle and sheep without the single report of an accident following its use. During the past year one of my assistants, Dr. Evans, had the opportunity to use this vaccine on some experimental sheep among which anthrax had appeared, with the result that 247 sheep weighed 23,927 pounds immediately prior to the administration of the first vaccine, and two days after the administration of the second vaccine weighed 25,115 pounds. This gain in weight (2,673 pounds) was similar to that shown throughout the experiment for which they were being used.

There are many features in favor of the use of properly attenuated cultures dried on threads which do not hold for a vaccine disbursed in liquid form. Our experiments show that vaccine prepared in this manner is still potent after a period of six years. It may be prepared in large quantities by a properly qualified technical officer in amounts sufficient to meet all requirements.

The advantage to the user is that he has a vaccine ready for use without the necessity for laborious shaking and he is certain that with the introduction of the thread beneath the skin the entire dose is given to the animal and no animal is given too large or too small a dose. Protection is thus assured against the administration of the second vaccine, and with the administration of the second vaccine, protection afforded against virulent anthrax.

The laboratory worker can produce sufficient at one time to warrant elaborate testing out on sheep or cattle which would be impossible with a liquid vaccine fresh grown every week.

In closing my remarks on anthrax vaccine I may state that I have purposely omitted mentioning killed cultures of the anthrax

organism. I believe that if we are going to destroy the vitality of our cultures before vaccinating we might just as well use some innocuous germ which we know will afford protection against anthrax for a varying period. Other points of interest have not been dealt with as the time at my disposal is limited and published data is available for those who care to go more fully into the subject.

Hansom Cabs and Other Carriages Returning in New York.—The following clipping from the New York *Evening World* and comment upon it, was extracted from a recent issue of the *Rider and Driver;* and, as it contains plain statements of facts, should be interesting and encouraging to veterinarians:

"In Fifth avenue and on Riverside drive, too, was a queer reversion to type. It was the return of the hansom cab.

"Nobody knows from where the old two-wheelers came. But it is true that there were more two-wheelers than taxis in the main up-and-down streets and the Riverside drive yesterday from noon until the yellow-and-wet dust simoon began.—*Evening World's* Report of a Sunday Parade.

"As our readers have been informed, the hansom cab has 'come back' for every day use both as a private and a public vehicle and is especially popular 'by the hour' for shopping and calling within limited zones. It is comfortable, airy and a pleasurable lookout. Now, not only the hansom, but all horse-drawn vehicles, are returning to the streets in daily increasing number. A few months ago gigs, broughams, phaetons, runabouts and similar traps were a drug in the market; at the Durland sale last spring they went off 'like hot cakes' at surprising high figures, which were in excess of more than half their original value. For example, Mrs. Bowen's miniature coach was sold to Mr. H. C. Jackson for $1,300. A lady's park phaeton brought $560, a gig $205, a runabout $215 and a top buggy $260. Carriage builders and dealers like Studebaker, Fiss, Doerr & Carroll and Van Tassell & Kearney report equally good prices and a demand greater than the supply * * *."

Dr. R. C. Longfellow, Toledo, paid us a flying visit on his return from Washington, D. C., the last week in September, and brought greetings from our brothers in the Buckeye state.

EQUINE DISTEMPER.

By Walter Lincoln Bell, D.V.S., Brooklyn, N. Y.

This disease, though known under many different names, as Influenza, Shipping Fever, Green Sickness, Stock-yard Fever, Pink Eye, etc., could very appropriately be termed as "Horse Plague," as it is in reality, the most serious factor to be considered in relation to the production and sale of horses. It has been known from the earliest times and veterinary literature contains many writings of this disease, though nowhere that I can find is the important fact considered that this, as "La Grippe" in humans, is but a primary condition and is in itself rarely fatal, but so debilitates the system that a secondary invader obtains a strong hold and in the case of full blooded plethoric horses, fed up for market, the tissues are in a very receptive condition for the rapid development of these secondary conditions, also if the history of the method, by which a horse finally reaches the market, is considered, it is as follows:

Purchased from the farmer, transferred to a feeding point, kept confined and heavily fed on easily assimilated fat-producing food, then shipped to a near market; so far passing through two centers of infection, from which the horse is shipped to a market farther East, and may in fact go through three or four of these sales before reaching the sales stable where purchased for use.

Each one of these markets is an active source of infection as well as each step of railroad transportation.

The development of fever at any point is temporarily combatted by means of strong febrifuges and the animal sent on to receive the same treatment as necessary. The result is that when the horse reaches the final market, he is not only well advanced in the basic original disease of distemper, but through excitement and exposure of transportation offers a fertile field for rapid development of any of the secondary invaders which may vary

in successive years, also the virulency of these invaders varies with different shipping seasons, which virulency has tended to be greater each successive fall, winter and spring, for the past three or four years, until the season just passed has probably seen a greater loss from distemper and its sequel than for many years. This can be accounted for in several ways, one is that draught and delivery horses are bought from raiser at a younger and more susceptible age; as before mentioned sent through several markets before received by final dealers, and also to the indiscriminate injection of experimental preventive serums, etc., and lastly to the fact that as in all contagious or infective conditions, the tendency is for successive outbreaks to assume a more severe type until the virus is attenuated, after which the cases become milder for a period, then again more severe.

As I before pointed out, distemper itself is rarely fatal, but the initial debility and depression caused is so intense that a secondary invader is readily received, tissues saturated, and unless animal has an individual immunity or great resistance, results are apt to be fatal. These facts being true, the real success is therefore in producing an immunity not only to distemper, but to the secondary micro-organisms. The difficulty heretofore has been that until now the organism causing distemper has never before been isolated and known.

January, 1911, Professor Wm. Lintz, M.D., Long Island City Hospital, N. Y., became interested from a bacteriological standpoint in an outbreak of distemper among horses of what was then Squadron "C" (now 2d Cavalry Regiment, N. G.), which manifested itself shortly after return of tour of duty at Pine Camp, N. Y., and which was causing us a very severe loss, as our mounts are purchased and fed privately without assistance from State or National Government. This outbreak commenced September, 1910, with three light cases followed at short intervals by more and more aggravated cases until the total number of afflicted animals was thirty, of which fourteen died, though all indicated forms of medicinal treatment were thoroughly tried, and the advice of Professor V. A. Moore, Cornell University,

Dr. Frank H. Miller, New York City, as well as several laboratories locally; but we received no material assistance until Dr. Lintz became interested in the outbreak, solely from a scientific standpoint.

From Lieder Krantz, a morgan stallion, used for our Remount Stud, Dr. Lintz isolated a bacilli (since called Bacilli Lintz) of the colon group that proved the specific cause as well as pneumococci, which he found was the secondary invader and cause of mortality.

This vaccine was used on three typical cases, one in the primary phase of distemper (Wright horse), one in secondary phase or pneumococcic infection, well advanced (Backhouse horse), and one in the third, and what had been always fatal phase in this outbreak (Painter horse).

The Wright horse received one vaccination of the vaccine. This with mild stimulant was only treatment administered.

The Backhouse horse had several complications, most serious of which was nephritis, Hexamethylenamine (Urotropine) was given for several days. This horse received four vaccinations in a period of about fourteen days, after which time the temperature had returned to normal and general condition so improved that no further medication was administered.

The Painter horse showed all indications of all the tissues being seriously invaded; temperature. The improvement noted in these three cases was so marked that we were positive that the specific organism has been isolated and in accordance Dr. Lintz prepared an immunizing vaccine of a reduced number of Bacilli Lintz. Ten horses were of different physical condition, temperature and pulse every four hours were taken, one day after which we inoculated them with above vaccine. The reactions were very similar to that of mallein and three of the horses showed considerable systemic disturbance, temperature rising to 105 and 106, increased pulsation, depression and anorexia, and in general typical characteristics of the disease, two of the reactors returned to normal condition in two days, and the third one received a curative inoculation the third, and was normal the

sixth, subsequent to the original immunizing. These results being so marked, we decided to immunize the balance of our mounts, about 82, and accordingly they received the same inoculation as the ten test horses; showing quite some reaction of about eight per cent. of the horses. The balance was very slight, if any at all. These reactors were given mild stimulants and all returned to normal within a few days after passing through a mild typical course of the disease. This absolutely checked this outbreak, and there were no more cases.

Eleven months after (December, 1911), a new outbreak started amongst some of the horses that had not been in the armory during the original trouble, and many of these horses were attacked very severely. These were immediately inoculated with the curative dose, and though there was a total of 35 cases, we had no fatalities, as before all other horses were immunized, and though the outbreak started about December 7, 1911, every case was successfully terminated, all other animals being immunized, and we were entirely through with this outbreak December 28, 1911, and every animal in good condition. No other treatment was used, aside from intestinal antiseptics and mild heart stimulants in the more severe cases.

Upon finding that we were contending with a form of distemper or shipping fever, I furnished some vaccine to Dr. Frank H. Wright for use in cases of usual form of distemper occurring in "Green Horses." The results were so satisfactory that he immediately adopted the procedure of treating all horses green purchased, by his clients, immunizing those not showing fever, and treating with curative vaccine the ones showing infection. His results were as follows:

In fifty cases occurring during November and December, 1911, in one stable, not treated with Vaccine Equina-Lintz, fourteen died. In forty-eight cases in the same stable during March and April, 1912, with Vaccine Equina-Lintz, one died, which through carelessness became exposed to cold and died of enteritis, as all these ninety-eight occurred in one stable, the test seemed conclusive.

Dr. Philip Weaver, Glen Cove, L. I., was supplied with this vaccine to treat a carload of horses, of which all were sick, having several dead in transit. His conclusions were that it was absolutely specific for distemper in its various phases. Though having given up general practice to specialize the treatment of pets, the success of our treatment of horses at our Armory became known, and I have been called upon several times to investigate and treat distemper in some of the large stables locally, of which an outbreak occurring in the horses of the Borough Development Company, January, 1911, was very interesting. There were seventy-two horses in the stables, one horse having died the day I made the original investigation. Four cases had already resulted fatally. Dr. Lintz naturally being interested in the case directed the autopsy, and took necessary material for culture and examination. His results were that the identical organism was easily recovered and pneumococcus here also proved the secondary invader and cause of fatality. They were of an exceptionally fine type of heavy draught horses. I treated fourteen cases, most of them of very serious phase, immunized the others and terminated the outbreak in about three weeks with no deaths and every horse ready for service.

One of the largest contracting concerns purchased eighty horses this spring. These horses approximated $500 each and were the pick of the market. Twenty had already died when I was called on, one of which died the following day, and from this autopsy Dr. Lintz recovered the original bacilli (Lintz) as well as pneumo and streptococci, and accordingly prepared an autogenous vaccine which was used after the third day. The initial vaccinations having been made with organisms from original outbreaks which have been kept growing and of full potency by passing through laboratory animals. Two were dying and there was a total of thirty severe cases for treatment. The two died the following day. One was so intensely saturated that I only injected very small numbers of organisms each day and though the animal showed considerable improvement, he died the sixth day. The remaining thirty horses were successfully treated and all horses returned to normal in nine days.

One of the local sales stables became interested in the vaccine during May of this year, and the results were so conclusive that they adopted it as their standard treatment, having lost but one horse, which, during convalescence, was put in a draughty place and a severe congestive condition developed, and the animal died the following day from intense endocarditis. Since initial use in May, 1912, this stable has treated a large number of cases. Many were severe and this was the only death. The results have been practically the same in one of the largest as well as the majority of smaller sales stables in New York City, and also in the practice of many of the veterinarians in the Greater City.

There can be no doubt as to the fact that Dr. Lintz has succeeded in isolating the specific organism causing equine distemper; not only are the above facts conclusive, but complete research work has been done and the following are the results: Agglutination reactions with the serum of sick as well as those that had recovered were positive; agglutination was still present in a dilution of 1-200. It is pathogenic for mice, rats, rabbits and guinea-pigs. Upon autopsy these animals showed marked parenchymatous degeneration of all the viscera, and the same organism was isolated. It is not pathogenic for dogs.

A horse was secured and this organism was inoculated both subcutaneously and intravenously. This horse was under the constant observation of Dr. Tiersen, a former Veterinary Captain of the French Army. Twenty-four hours after the intravenous inoculation of a saline emulsion of six agar culture tubes, which tubes had been inoculated with the Bacilli Lintz and incubated for eighteen hours, the horse's temperature rose abruptly to 105. He refused all nourishment and exhibited signs of marked weakness and constipation. The temperature for the next three days fluctuated between 103 and 106, gradually returning to normal at the end of five days. The cardinal symptoms of the disease, namely, hyperpyrexia, slow pulse, anorexia, weakness and constipation, were reproduced in the experimental animal.

Further proof is also found in the fact that we have also been able to control and stop severe outbreaks in stables contain-

ing a large number of horses. In these instances a vaccine of Bacilli Lintz only was used, and such immunization held perfectly.

It would be unnecessary to go into a lengthy description of symptoms etc., of this condition, as we are all familiar enough with it in its various manifestations, but the cardinal symptoms as I have observed them in two years' experimental work, covering many cases, are, first, high temperature with little pneumonitory symptoms; second, anorexia, often complete, constipation third; intense depression and weakness fourth; and to my mind an important feature is that the temperature may be as high as 107 degrees Fahrenheit, yet the pulse will be only about 60 and strong. This covers the primary phase or distemper proper, and lasts from three to five days, gradually subsiding to normal for one to three days when the animal becomes again very sick, temperature high, then fluctuating, showing septic invasion, pulse higher and weaker, breathing indicates lung involvement, weakness exaggerated, anorexia complete and unless animal possesses strong immunity and resistance, death occurs. This is due to the secondary invader, which is pneumococci in the majority of cases, but may also be complicated with streptococci.

Veterinarian Assists Medical Men Reporting Important Cases.—We have had the privilege of perusing the *Australasian Medical Gazette* for April, 1910, and also for April, 1911, and we find in the former a report of a case of "Bilateral Tubal Pregnancy with Rupture on Either Side," by T. G. Wilson, M.D., Gynæcologist to Adelaide Hospital, in which Veterinary Surgeon Desmond, of Adelaide, prepared the specimens and microscopic sections, photographs of which, and of the two pregnant tubes, taken by Desmond, are used to illustrate the article. In the 1911 number, we find a most interesting report of a very unusual condition (to the veterinary mind at least) of a tumor at the base of the brain in a woman, causing Acromegally. This case, in which Veterinary Surgeon Desmond photographed sections of the brain that are used to illustrate the article, presents such interesting symptoms that we shall reproduce it in whole or in part in a future issue. It is men like Desmond that do much to amalgamate the two branches of medicine and surgery.

VETERINARY EDUCATION COMES INTO ITS OWN IN THE WEST.*

By F. W. Beckman, Ames, Ia.

Veterinary education is coming into its own in the mid-west with the completion of the new $200,000 set of buildings for the veterinary school at Iowa State College at Ames. When Dean C. H. Stange and his associates open the fall term's work in the new structure, they will be housed in the largest and most complete institution of its kind in this country or any other.

Dr. Charles H. Stange,
Dean of the Veterinary Medical School.

A good many new ideas have been worked out in the arrangement of the Iowa veterinary buildings. Each of the departments has been given a separate building so that its work may go on without interference from other departments. Yet they are brought closely together by a covered passageway that connects all of the buildings, both main floors and basements. With this arrangement, the head of each department can be fixed definitely with responsibility for what goes on in his department, thus facilitating administration. The buildings with their connecting

*This story is furnished with the compliments of Iowa State College.

passageways surround a large inner court which makes possible perfect lighting and ventilation, always so important in veterinary college buildings. Every structure is lighted from all four sides and laboratories and dissecting rooms have an abundance of light and fresh air. The whole set of buildings occupies a space 339 feet by 256 feet in size, the equivalent of a full city block.

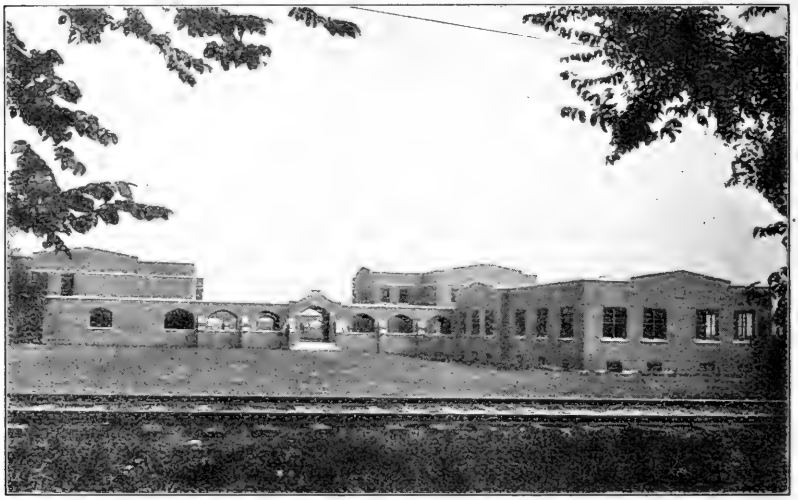
There are five buildings in the entire group, three at the front and two at the rear. Sometime later a sixth building will be added at the rear to house the research and experimental work of the college. When this extra wing is completed, another $40,000 will have been invested by the state. At the center of the

A view of the front of the new veterinary buildings at Iowa State College showing the administration building at the center and the pathology and bacteriology laboratory at the farther side and physiology laboratory at the near side.

three buildings in front is the administration building, which contains the general offices, the library, an assembly room that seats 200, a large general museum and faculty rooms. On one side of this central building is the pathology and bacteriology building, and, on the other, a building devoted to the physiology laboratories and the pharmacy class rooms. The laboratories in both structures have complete and modern equipment. In this respect they rival the best of college laboratories in the country. Especially interesting is the animal physiology laboratory. It is the most complete to be found in a veterinary college in this country. It represents the last word in this branch of veterinary sci-

ence, which is only now getting its rightful recognition as a part of veterinary education.

At the rear stands the large clinic and hospital building, 163 feet by 61 feet, and the anatomy building. In the hospital building there is capacity for 70 patients, including kennels for 22 dogs and other small animals. There is, also, an isolation ward for the treatment of contagious diseases. Throughout, this hospital building is constructed of brick, cement and steel, and every nook and corner of it may be thoroughly cleansed and disinfected.



A view of the veterinary buildings at Iowa State College from the south side showing the inner court and the connecting corridors.

Every stall is equipped with slings. There are three operating rooms in this structure. The largest, 65 feet by 30 feet, opens into the inner court. This is used for the examination of animals as they are admitted and for minor operations and treatments. Adjoining it is a clinical amphitheatre and next to that is the third operating room for large animals, equipped with a hydraulic operating table. Near by is a dispensary and instrument room and off of that the office and living apartments of the house surgeon. Throughout this hospital building is equipped with white enamel and glass instrument cases, operating tables

and basins, while the small animal operating room looks for all the world like an operating room for humans.

The anatomy building contains perhaps the best lighted and the most complete animal dissecting room in the country, besides an unusually large amphitheatre class room where animal carcasses may be brought for special dissection. The dissecting room is as far different from the usual veterinary dissection room

Instrument room and dispensary of the veterinary buildings at Iowa State College.

as may be imagined. Not many medical colleges can boast better facilities for their work.

Iowa has been generous with its veterinary school for several reasons, chiefly perhaps because Iowa is a great live stock state. Dean Stange estimates that the value of all kinds of animals in Iowa at the present time is not less than $450,000,000. He estimates, further, that there is an annual loss of live stock from preventable disease amounting to $10,000,000 at least. These facts are responsible for the building of a school to train veteri-

nary doctors that measures up to the need. Dean Stange had another purpose in securing a building that some visitors say is good enough for the care and treatment of human beings. That purpose was to give the young men who attend Iowa's veterinary school a proper idea of the dignity and importance of their work. Unconsciously, the splendid building, with its fine equipment and its strict cleanliness, must teach veterinary students that their work is worth while, that its standards should be high, that it should be dignified, that it should command the best kind of men and that it should get the very best service from them.

Many veterinarians have visited the new buildings and they are unanimous in their praise of it. Dr. A. M. Farrington, assistant chief of the Bureau of Animal Industry at Washington, said that he thought that the building stood for the very best ideals in medicine. He added that if Iowa did not graduate a new and better type of veterinarians, he would be much disappointed.

A Correction and a Request.—Under the caption, "The Veterinarian in Relation to Public Health," a paper was presented to the Veterinary Medical Association of New Jersey in July, 1912, by Percival K. Nichols (veterinarian to the New York City Board of Health for the Borough of Richmond, and also to the New York State Department of Agriculture in Richmond County), and was published in the September number of the American Veterinary Review, beginning page 682, giving as its author, Harold E. Stearns, Arlington, N. J. This error occurred through Dr. Nichols' paper being received without bearing his name on any part of it, and the fact that Dr. Stearns also presented a paper at the same meeting bearing the same title; so in looking over the program to find an author to fit the title of Dr. Nichols' paper, Dr. Stearns' name was erroneously appended. We therefore ask each individual reader to make the correction in his September number by drawing a line through Dr. Stearns' name and address and supplying that of *Percival K. Nichols, D. V. S., Port Richmond, N. Y.* Kindly do this now, lest you forget.

REPORTS OF CASES.

CESARIAN SECTION.

By W. E. Neil, D.V.S., Kirksville, Mo.

On the tenth of June I was called to see a Boston bull terrier that was due to whelp. I was told by the owner that she had taken sick the day before. She was laboring, but the pains were of short duration, and far between. There was no delivery yet made. But on examination, I was able to feel the top of the head of one puppy; and by manipulation, the head was raised, and in a few minutes there was a delivery. So I left the patient in the care of the owner, and told him, I thought that she might give birth to the remainder without assistance. But at two o'clock I was called, and found there was no progress made. Upon examination I found there two puppies presented as far as the ilium of the mother would permit. These puppies had their heads hooked over each other's neck, and when she would labor they

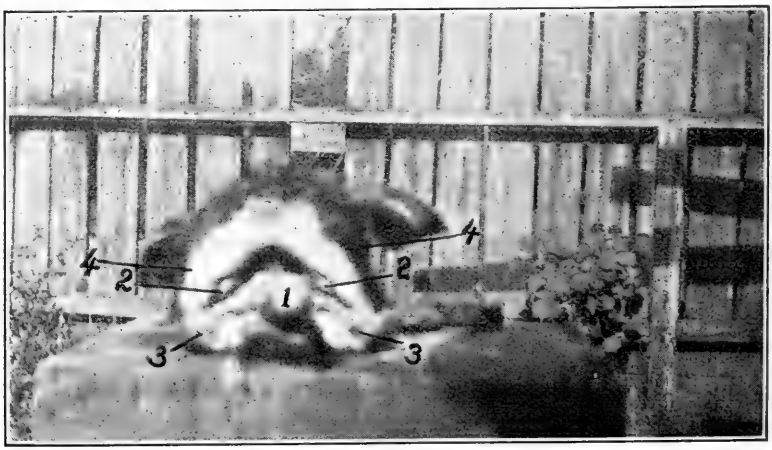
would both present at the same time. So I was unable to get them separated, she being too small to use instruments, as this was her first time to whelp. So about 6 p. m. I prepared to operate. She was placed on the operating table, the field for operation was shaved and cleansed, and she was given ether until

completely anesthetized. A bold incision was made in her left side, absorbent cotton was placed around the opening, the horns of the uterus containing the foetuses were brought out and laid on the absorbent cotton, an incision was made in the horn, on the upper side extending to the body of the uterus. The foetuses were removed from both horns by the same opening. There were eight alive and one dead. After removing the contents of the uterus, the opening was sutured up with sterile catgut, turning the serous surfaces together, making the Lembert stitch. The organ was then replaced and the abdominal peritoneum sutured with catgut, the muscular structures and skin with linen tape. The parts were dressed with iodoform, flexible collodion, the parts covered with absorbent cotton, and a many-tailed bandage applied. She came from under the anesthetic in about thirty minutes, was given strong coffee in small quantities every hour during the night. Was irrigated the following day with a 5 per cent. boracic acid solution, and was given liquid food for a few days. She made a nice recovery, and six of the puppies are still living, but three died for lack of nourishment. The mother and puppies are healthy, as you can see by the picture. There was no suppuration and the stitches were removed in four days and left scarcely a mark or scar.

A DIVIDED PALATE.

By Fred W. Porter, D.V.M., Tampa, Fla.

I am inclosing a photo print of a calf's head that was recently delivered by me. I have the original preserved in formaline.



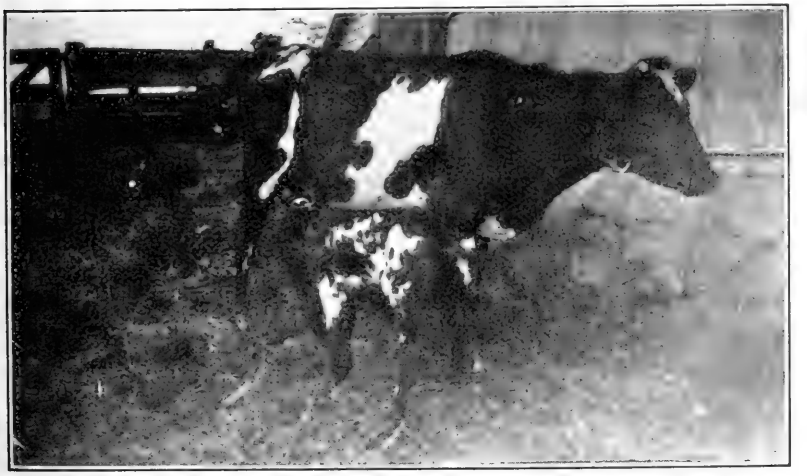
It is a complete specimen of divided palate (palatognathus). The print shows the view, looking directly into the mouth. The fig. 1 is the tongue; fig. 2, the turbinates; fig. 3, the nostrils, six inches apart; fig. 4, eyes, lids formed but not opened.

Cow had been in labor some hours when I was called. Examination showed a cross presentation with all four feet at the inner os. Tried to deliver by head and fore feet, but of course was unsuccessful; I could feel something that felt like a nose but incomplete. Turned foetus and made a breech presentation without serious difficulty. Had an astonished owner when that head came in sight. Think it unusual enough to send you a report of it.

A CASE OF EARLY MATERNITY.

By A. N. Towner, D.V.S., Brewster, N. Y.

The accompanying picture, is of a heifer that gave birth to a live calf (calf is still living and doing well) when she was but one year and three days old. To me this was rather unusual, as I had never seen or heard of one "coming in" so young.



This calf was kept in a pen all winter with three or four others and fed milk. This spring she was turned out and in a short time showed that she was "making bag." The owner did not think anything of this until one morning on going to the pasture to salt the dry stock, he found the heifer with a calf at her side.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Obscure Cause of Death in a Pony [*Thos. A. Huband, F.R.C.V.S.*].—Pedigree yearling pony showed symptoms of subacute abdominal pains and treated accordingly; castor oil, colodyne in warm milk. The pains were relieved, but death took place within 35 hours. At post mortem no abnormal conditions were found except that the mucous membrane of the colon was ulcerated. The lesions were in outline somewhat ovoid, varying from one-third to one-twelfth of an inch in size. No perforation could be found. This condition was considered as due to *bacillus necrosis*.—(*Vet. Record.*)

Fracture of the Ospedis [*J. F. Macdonald, M.R.C.V.S.*].—Roan van mare, six years of age, makes a false step while at work and is lame on the near hind leg. The next morning she is in great pain and unable to carry weight on that leg. The foot examined revealed tenderness about one inch in front of the point of the frog. One or two days later pus is found, followed by sloughing of sensitive laminæ. The discharge lasted for some time, but had odor of caries. Eventually the animal got well except being lame with low ring bone. Left at rest the mare was, after three months, able to do her work. She died six months later from rupture of the heart. The photo which illustrates the record shows that the fracture extended from one of the articular glenoidal cavity of the upper face of the ospedis and extended all through the thickness to the inferior face.—(*Vet. Rec.*)

Heart Disease Causes Paralysis in a Dog [*J. R. Hodgkins, Capt. A.V.C.*].—Ten-year-old terrier has just left his owner well and bright and an hour and half after he is sick, unable to stand and drags his hind quarters. A purge is given. The author sees him three days later and finds him completely paralyzed from the 11th dorsal vertebra back. Pulse is slow and regular. Temperature 101°F. Urine drips slow and easily evacuated by pressure. The dog is destroyed. Heart, spinal cord and prostate

gland are the only seats of lesions; pericardium normal; left myocardium showed light buff colored spot which extends through the thickness of the ventricle. Mitral valves inflamed, thickened and with granulations, one is as large as a horse bean. Tricuspid valve also diseased, but more extensively. The aortic valves are only inflamed. Spinal cord had its vessels extremely injected. The cord was soft and pulpy, the posterior part almost creamy in consistency. Portion of the lumbar cord was considerably inflamed. The prostate gland was enlarged.—(*Vet. Record.*)

Separation of Colon and Rectum in a Mare [*Mr. C. G. Hill, M.R.C.V.S.*].—This case was reported at the Veterinary Association of South Durham and North Yorkshire.

The mare foals and seemed all right until the next day, when she showed little pain. She had not passed feces and except a small tear on the vagina she seemed all right. "On passing his hand into the rectum the writer entered a large sac and it was with much difficulty that he found the entrance of the floating colon. When he had passed his hand through the opening it closed upon it, and in withdrawing his arm the bowel closed tightly round his wrist and was drawn out through the anus" when it was liberated back. The mucous coat of the bowel was deep purple in colour. The mare lived for a week, had no great pain, ate some mash and grass. At the post mortem all the organs were found healthy except the colon and rectum were separated from each other; the ends of the bowels were gangrenous. It was thought that the mare when straining at the time of foaling had caused an intussusception and as time had gone on sloughing had taken place at that part.—(*Veter. Record.*)

Recurrent Umbilical Hernia With Chronic Pneumonia [*J. J. O'Connor, M.R.C.V.S.*].—Eighteen-months-old thoroughbred colt had congenital umbilical hernia, for which he was operated by Degive's method. Through neglect from the owner in following advice about diet and hygiene of the colt, the hernia returned and then the ring was large enough to admit the insertion of both hands. *Treatment*: Anesthesia, aseptic and antiseptic precautions taken, hernial sac is open, the left hand in the abdomen keeps bowels in, insertion of Halstead's sutures through the edges of the ring with pledgets of gauze to prevent great tension on the sutures, another series of same sutures inserted through the neck of the sac, iodoform and bandage dressing

round the body. For the first 13 days temperature of the colt varied between 104° and 105° F. On the 19th day appearance of improvement. Temperature 103°. On the 21st day it went up again and then varied up to the time of death, which occurred some two weeks later.

At the post mortem typical lesions of chronic pneumonia was revealed with local peritonitis having caused adhesion of the cœcum to the abdominal wall and to a portion of the ileum.—(*Vet. Journal.*)

Introduction of Air Into the Jugular [*Frank Chambers, M.R.C.V.S.*].—Record of three experiments made by the author upon three head of cattle, which were diseased with East Coast fever. The first received a first intravenous injection of air, 100 c.c. when the respirations increased from 38 to 58 a minute and to 61 after injections of 400 c.c. This cow received 2346 c.c. of air and died in 12 minutes.

In the second case 100 c.c. increased the respiration to 58 and afterwards receiving 500 c.c., they run up to 105. It took 2500 c.c. of air over a period of four and a half minutes to cause death.

The third animal was a cow, in which the injection was administered quickly and where death required 3000 c.c. of air before it occurred.—(*Vet. Journ.*)

Septic Metritis in a Bitch [*R. Branford, Punjab Vet. College*].—Bitch is in a state of collapse. She had four puppies seventeen days before and a fifth had to be taken away from her. She had appeared well ever since, but was suddenly taken sick and rapidly grew worse until she is in the state mentioned. Uterus is washed and relieved of all its infecting contents and repeated injections of chinosol are prescribed. The body is wrapped in flannel wrung out with hot water. The temperature which had been up to 109° 4F, dropped the next day to 107°, to 102°, to 101° and finally, with quinine, little beef extract, milk, the animal recovered. The interest of the case rests on the sudden onset of the symptoms of intoxication so late after pupping and the very high temperature.—(*Vet. Journ.*)

Sarcoma of the Small Intestine [*E. Clive Webb, F.R.C.V.S., Captain A.V.C.*].—This grey mare, aged 7 years, has for the last six months, up to the date of death, been suffering with frequent attacks of colics. She was very poor in condition

and her appetite capricious. Her abdominal pains were subacute and dull, being manifested by constant lying down, pawing, etc. Constipation was not a marked feature, and towards the end the colics had become more violent. Rectal examinations, renewed several times, revealed nothing which could help in making a diagnosis. Tuberculine test was also negative. At the post mortem, the body was found extremely emaciated and on opening the abdomen a large solid tumor was detected "incorporated with the bowel wall about the junction of the gejunum and ileum. On section, it was found that the lumen of the bowel actually penetrated the centre of the solid-looking fibrous mass, which was the size of a cocoanut." Examined with the microscope, it was pronounced round-celled sarcoma.

There was also a stricture of the small intestine, not sufficient enough, however, to interfere with the passage of its contents.—(*Vet. News.*)

FRENCH REVIEW.

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

Pericarditis in the Horse [*Mr. Bouquet*].—Cryptorchid, this horse is operated. One testicle only is apparent, and removed by covered operation. The other is deep in the inguinal region and is taken off with the emasculator, after catgut ligature of the cord. Slight hemorrhage takes place the next day and is easily controlled. The horse is doing well and ten days after is moved to another stable, where he is alone. Three days after he roars a little, refuses his food and has spells of dyspnea. His temperature is 39° 5C, respiration 32. There is a slight puffing of the head about the supra orbital depressions. Sore throat is diagnosed and proper treatment prescribed. The next day the animal is much worse and dies before the writer gets there. Post mortem made immediately shows that the operation of castration has nothing to do as cause of death. The thorax open, explained it. The pericardium contains about 15 litres of serosity, and while its internal face is covered with ecchymoses, there is adherence of its external face with the left pleurea. This is quite strong and formed of fibrous tissue slightly gelatinous and easily torn. The trouble was probably of old standing and possibly might have been relieved, if diagnosed.—(*Rec. de Med. Vet.*)

Acute Stomacal Dilatation in Dog [*Mr. L. Naudin*].—Concise note to call the attention to a lesion generally overlooked

and noted by the author only twice at post mortem of adult dogs. In both cases the conditions were exactly alike. Dog in perfect health is taken, shortly after meal, with sudden illness, shortness of actions, arrest, suffocation, death—all in about 10 minutes—nothing can be attributed as the cause of this rapid fatal ending. Post mortem made a few hours after death shows excessive swelling of the whole cadaver, thoracic visceras show all the lesions of asphyxia, heart in diastole is filled with black, unclotted blood. Opening of the abdomen exhibits a pushing forward of the diaphragm muscle by the stomach, enormously distended by gases. The duodenum is filled also. There is no displacement of organ nor any strangulation anywhere. Nothing, in fact, except an acute, idiopathic dilatation of the stomach, very different from the torsion of that organ.—(*Rev. Gen. de Med. Vet.*)

Alcoholic Acute Intoxication in a Cow [*Mr. Leduc*].—The cow is lying down in an abnormal attitude. She moves about in an automatic manner every two minutes and moaning in a peculiar manner, and these correspond to jerky expirations. The respiration is accelerated and interrupted now and then. The pulse is irregular, the eyes twisted in the orbits, there is no defecation nor micturation. The temperature is normal. It is completely impossible to make the animal get up. In the presence of such severe symptoms and fearing an encephalic or meningeal affection the owner has the cow slaughtered. At the autopsy were found congestion of both lungs, with apoplectic spots in some lobules. The liver and spleen are enormous and when cut through leave escape to very red serosity. Rumen and other stomachs contain food having a very strong alcoholic odor. The small intestine has the same odor. A careful inquiry gives the information that, left loose in a farm yard, the cow had drunk from a barrel about 12 litres of the distillation of cider recently made.—(*La Presse Veter.*)

Comminuted Fracture of a Rib in a Mare [*Mr. Vignard, Army Veterinarian*].—Surprised stealing oats after getting loose from her stall, the mare runs through a door and receives a deep wound by a hook, about its middle of the right costal region. The skin is torn, about 40 centimeters in length, and the panniculus, serratus magnus and external intercostal muscles are involved in the tear. The 10th, 11th, 12th and 13th ribs are exposed and from the 12th a splinter is torn from the outer surface, measuring 12 centimeters in length. The spongy substance is exposed

and yet there is no transversal solution of continuity. The pleural cavity remains protected only by the thin layer of the intercostal muscles. After, as thorough disinfection as possible and removal of some loose splinters of bones and of the loose soft tissues, the wound was closed with stitches, except over the central portion to leave the 12th rib exposed. Boric acid dressings were prescribed and with antiseptic injections; the wound gradually healed in due time, the mare resuming work after a month. —(*Rev. Veter.*)

NITRATE OF PILOCARPINE IN TETANUS [*MM. Remond and Aouizerate*].—Record of two cases which were treated with success after other treatment seemed to fail and fatal end looked for.

The first case was in an eight-year-old horse which, after a superficial wound of the croup, showed marked symptoms of tetanus. These progressed rapidly and the owner was considering the propriety of killing him when injections of nitrate of pilocarpine were suggested. During four days the animal was kept in a dark stable and received repeated injections of pilocarpine. Improvement soon was manifested and after a long convalescence the horse resumed work.

The second case was more severe in its development. Following a suppurative arthritis of the left stifle joint, he was submitted first to injections of tetanic serum, but as this did not seem to arrest the disease, sub-cutaneous injections of pilocarpine was resorted to and after eight days of treatment the animal was considered out of danger.—(*Bullet. de la Soc. Cent.*)

TUBERCULOSIS OF THE SUPERRENAL CAPSULAE IN BOVINES [*Mr. P. Chaussée, Vet. Inspect.*].—Similar cases are very exceptionally observed. A cow six years old, very thin, without muscular atrophy, presented lesions of tuberculosis of its lungs well marked and hematogenous ones in small numbers. The renal regions were covered with abundant vegetations and one of the suprarenal capsulæ, weighing 25 grams, contained a big caseous tubercle. The other capsule was more diseased, weighed 160 grams, and was also caseous.

Again, in a five-year-old steer, having generalized tuberculosis, without peritoneal lesions, there was on the left gland two caseous tubercles, entirely similar to those of the other tissues, developed in the medullary substance of the gland, while the cortical portion was free.—(*Bullet. de la Soc. Cent.*)

BIBLIOGRAPHY.

PRINCIPLES OF MICROBIOLOGY.

PRINCIPLES OF MICROBIOLOGY. A Treatise on Bacteria, Fungi and Protozoa Pathogenic for Domesticated Animals, by Veranus Alva Moore, B.S., M.D., V.M.D., Professor of Comparative Pathology, Bacteriology and Meat Inspection, New York State Veterinary College at Cornell University, and Director of the College. Over 500 pages and 101 illustrations. 1912. Ithaca, N. Y., Carpenter and Company.

This work is the outgrowth of a lecture course by the author to his student body, which has accompanied the laboratory work in bacteriology and protozoology, and has been prepared as a textbook for veterinary students beginning the study of microbiology; whose purpose has been to point out the rôle of microorganisms in nature; to give the methods of their study and identification; to indicate the relation of certain species to animal diseases; to give a description of the more important species pathogenic for animals; and to discuss briefly the reaction of the tissues to microbian invasion and the theories of immunity. It is not exhaustive, but rather elementary in character. Being a teacher, the author has realized the fact that the undergraduate can only familiarize himself with a few of the essential facts and principles, and so has only given the essential principles and theories of infection; and in order that the volume may be of further aid as a key to the *entire* subject, numerous references to the literature are given, where the student can obtain at first hand the results of original research; and further, a list of text and reference books are appended. Chapter I is an Historical Sketch, which is extremely interesting and instructive; Chapter II deals with Bacteria and Their Place in Nature. Chapter III, Morphology of Bacteria. Chapter IV, Classification of Bacteria and the Identification of Species. Chapter V, Bacteriological Apparatus, and so on throughout the work, the subjects of Sterilization and Disinfection, the Preparation of Media for the Cultivation of Bacteria, the Isolation and Cultivation of Bacteria, the Examination of Cultures, the Microscopic Examination of Bacteria and Stains Employed, Vital Activities of Bacteria, the Use of Animals in Bacteriological Examinations and Investigations, the Bacteriology of Water and Milk, the Genus Streptococcus and its Species Pathogenic for Animals, Genus Micrococcus and

the Genus Bacterium in the same sense; a Few Species of the Genus Bacterium which Are Commonly Not Pathogenic, the Genus Bacillus and its Species Pathogenic for Animals, the Genus Pseudomonas, Migula, Higher Bacteria and Fungi Pathogenic for Animals, Protozoa, their Classification and Species Pathogenic for Animals, Epizootic Diseases of Undetermined Etiology (Filterable Viruses), Specific Bacterial Products, Tissue Reactions and Immunity, Serum Diagnosis and Immunity and Vaccine Therapy are all respectively dealt with in the remaining twenty chapters. The author's clear and concise manner of expression and the many illustrations make the study of microbiology fascinating and its principles easily mastered. Mallein, vaccine, tuberculin, etc., are all discussed, both as to their preparation and use, also the agglutination test. So that *Moore's Principles of Microbiology* is an indispensible volume to the veterinary students and to the older practitioner who would be in possession of the present-day knowledge of this important subject.

The New York Veterinary Schools Open.—The New York State Veterinary College at Ithaca, opened September 23, and the New York-American Veterinary College in New York City opened September 26 with excellent prospects for the 1912-13 term.

Renewed Energy in the Live Stock Journal.—This enterprising stock paper, edited and published by Mr. T. Butterworth, Chicago, has always been a live one, and has always had up-to-date views on all matters pertaining to live stock, inspiring an increasing interest in draft horse breeding by constantly sustaining that branch of live stock industry. But in the last few months it has taken on a new dress, coming out in pale green covers, and has in other ways exhibited evidences of new life generally, which have not escaped the notice of the Review any more than that of its many readers who look to it for advice in the many breeding problems which they encounter daily.

OBITUARY.

THOMAS EARLE BUDD, D.V.S.

Dr. T. Earle Budd died at the Orange Memorial Hospital, Orange, N. J., at 4 a. m. September 13, 1912, as a result of blood poisoning; he having become infected while performing an autopsy on a cow, supposedly suffering from anthrax. The doctor was taken to the hospital three days prior to his death, and appeared to be improving up to the morning of his death, when he changed for the worse, and the end came rapidly.

Doctor Budd was 52 years old, having been born in Pemberton, N. J., in 1860. He was graduated from the University of Pennsylvania, and studied veterinary medicine at the American Veterinary College in New York City; from which institution he received his veterinary degree in 1892; when he at once began to practise his profession at Woodbury, N. J. After a short time, however, ill-health demanded a change of residence, and he moved to Orange, N. J., where he enjoyed a lucrative practice up to the time of his death. He was deeply interested in state affairs, especially when in connection with his profession. He has filled the following official positions: Member of the Army Legislative Committee, A. V. M. A., Member of Live Stock Commission of New Jersey, Treasurer of the New Jersey State Board of Veterinary Medical Examiners, Veterinarian to the Essex County Park Commission, Veterinarian to the Essex Troop, N. G. S. N. J., Inspector of Tuberculosis of the State of New Jersey. Has always been an active member of the Veterinary Medical Association of New Jersey, and has been president of that organization and has also occupied the executive office of the Alumni Association of the New York-American Veterinary College.

A few years ago Dr. Budd was sent by the State of New Jersey to Scotland to purchase Clydesdale stallions for the improvement of the draft and work-horses in that state. He occupied a high social position in his community and was highly respected and esteemed by his fellow townsmen for the upright and honorable life that he had lived amongst them; and his sudden and untimely demise has been a great shock to them. His domestic life was beautiful. He is survived by a widow and one daughter, Mrs. Victor Schwartz, to whom the hearts of the entire community turn in their sad bereavement.

ARMY VETERINARY DEPARTMENT.

STATUS AND PROSPECTS OF THE ARMY VETERINARY BILL.

"H. R. 16843, a Bill to consolidate the veterinary service, U. S. Army, and to increase its efficiency," has not passed Congress during the session just ended.

The Bill had been favorably reported by the Committee on Military Affairs of the House of Representatives on April 26, 1912. There were hopes entertained by the chairman of the legislative committee, A. V. M. A., and by many of his supporters, that the Bill might be passed by the House of Representatives, and that, perhaps also, it might be favorably reported before adjournment of Congress, by the Committee on Military Affairs of the Senate.

But the Army Service papers do not report any further progress of the Bill, so that the net result accomplished so far remains the favorable recommendation of the Bill by the Committee on Military Affairs of the House of Representatives.

Small as this result may appear to the pessimists, always with us, it is yet of the first magnitude. It constitutes the driving cone for the future onward march of the Bill. Several times the Senate did pass our former army veterinary bills, but they were always blocked in the Military Committee of the House. It was, therefore, a good strategical move of Chairman Hoskins to commence his labors with that latter committee, and the success he attained there gives him a sure foundation by having overcome the most difficult part of the work first. The House would have undoubtedly passed the Bill on the favorable recommendation of its Military Committee, but the turmoil of the closing days of Congress undoubtedly prevented it from being taken up on the floor of the House.

This is the present status of the Bill. It is not known what plans have been made by the chairman of the legislative committee, A. V. M. A., for the fight in behalf of the Bill, during the next session of Congress reconvening on December 4, 1912. He has the situation well in hand, to use a phrase. Not his

phrase, but one just given to the writer by mail by one of his staunchest supporters in the campaign just ended. This letter also brought the news that Dr. Hoskins had consented to remain on the legislative committee, A. V. M. A., which was doubtful. This is as it ought to be, because he is not only thoroughly acquainted with the situation in and around Congress, but he has also thoroughly canvassed both branches of Congress, and, above all, he has a bunch of promises of support in his hands that nobody else could make proper use of in guiding the Bill towards its passage.

What we need now to do is to strengthen the hands of Dr. Hoskins in making careful plans for the finishing campaign of the Bill during the next session of Congress. Such plans, to be transmitted into action, need the continued enthusiastic support of the entire American veterinary profession. The fight fought so far, has shown our colleagues all over the country united in effort, so full of unity, strength and will as was never witnessed before in any of our former legislative attempts. If this proof of good will and united effort is continued for just a fraction of another year, a great, general victory will be won during the next session of Congress. It is not only that the Army Veterinary Bill is at stake, but the reputation and standing of the whole of our profession, which does no more than ask for its legitimate right to practise our science in an intelligent manner in the United States Army. As we are right, we must win out some time, and the chances are good, in fact better than ever before, that we shall carry our point during the winter session of 1912-1913.

This is the way the situation looks to the writer. He is not unmindful of the tremendous amount of earnest work that lies before us in trying to accomplish this work, nor does he underestimate the tenacity that will be needed to overcome certain obstructions that lie now, as ever before, in the way of this little Army Veterinary Bill. Their nature is well known to those who are initiated into the mysteries of the game of politics, and who understand the sentiment and established power of opposing forces.

But with all these things, and the persons representing these things, facing us, we are justified in looking at the situation with hopeful optimism. With apologies for the pessimists: Here is to the victory of the Army Veterinary Bill during the next session of Congress. And I shall drink to this toast, at the proper time, in genuine beer in old Germany. O. S.

ARMY VETERINARY NOTES.

Veterinarians Walter R. Grutzman, 15th Cavalry, and Olaf Schwartzkopf, 3d Cavalry, have each been granted leave for four months, with permission to go beyond the sea, to take effect in October. Their itinerary includes visits to the Army Veterinary Schools at Aldershot, England; Saumur, France, and Berlin, Germany, and to several of the renowned European veterinary colleges. Mrs. Schwartzkopf will accompany her husband.

Veterinarian Henry W. Peters, 14th Cavalry, was granted a leave of two months at his return from the Philippine service, and is now enjoying with Mrs. Peters a well earned vacation at his home state.

Recently it was decided by War Department order that veterinarians and chaplains of Cavalry and Field Artillery need not take the obstacle rides prescribed for officers of the mounted service. This is the second time that army veterinarians have been exempted from proficiency tests in riding, and it is greatly to be regretted that this was done on the request of some of our colleagues. We have to give instruction to officers in hippology, and are almost daily consulted on questions of conformation and capacity of horses as officers' mounts. An army veterinarian who can only teach the theories of hippology and who has never himself practised these theories by personal application, can only be a poor teacher and judge on these questions, and really ought not to be in the army service in mounted regiments. If we want to make for advance in the army veterinary service and become officers of an army veterinary corps, we must cease to consider ourselves qualified by just applying a little salve here, a liniment there and occasionally a hypodermic injection, as do mere medicine men. We must become military horsemen, which the field service demands of us by its very nature. The veterinary officers of all European armies are required to be expert riders, because their position requires the knowledge and practise of skilled and fearless riders. The time is at hand when we must be in the same class.

The case of the chaplains is entirely different. No knowledge of horses is required of them, and their dignity suffers nothing by making poor figures on horseback if they accompany mounted troops. It is a pity that by the leniency of the War Department we are put in the category of chaplains in this respect.

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

At the conclusion of a night letter sent from Indianapolis to fill a space left vacant in our editorial pages to receive a few advance words on the 1912 meeting from the convention city, we stated that a detailed account of the Indianapolis meeting would be published in our next issue. In addition to these few advance words editorially, we also gave our readers, in the September REVIEW, a little over five pages of notes on the meeting —the essence of what transpired in brief—including the resolutions presented and adopted. It now, therefore, but remains for us to round out our report in the present number, giving it the fullness that neither time would permit nor our remaining space accommodate in the September issue. President Brenton, after formally declaring the forty-ninth annual meeting in session, introduced the Hon. Charles Bookwalter, ex-Mayor of Indianapolis, who welcomed the association to his city in the following appropriate and pleasing words:

Mr. President, and Ladies and Gentlemen: I feel as though this will be a memorable day in my life. First, because I am permitted to stand in a position which should have been occupied by the distinguished ex-Vice-President of the United States, a resident of our good city, who unfortunately has been called out of town. I feel that first of all it is essential that I should apologize to you for the great descent which naturally comes from the ex-vice-president down to the ex-mayor. The chasm is so broad that it will not take the fervid imagination of a "horse-doctor" to conceive of my performing the function this morning. However, I can only do the best possible under the circumstances.

Secondly, it is a memorable day to me because I have been asked to address this morning this distinguished gathering of not less than five hundred representatives of your profession from all sections of the country, and because I have been initiated, at least in the first degree, into the presence of so many surgical instruments, which to me is an education in itself, and modesty compels me to confess that the only one, the use of which I thoroughly understand, was the one with which I was presented. It

is a very useful instrument, in the use of which all of us have been educated, and which many of you recognize has a very broad application. For the benefit of the members of the press who are present, I would say that I was informed that it was a bottle-opener. (Laughter.) I presume that is not the proper name for it. I presume its use is not confined to any one particular kind of bottles, but you know how it is, somehow or other the Hoosier mind always associates a thing of that sort with that particular brand. I have been educated in the use of this delicate little instrument, which is so convenient at times, and the absence of which is so embarrassing whenever an emergency presents itself.

As I look out at this audience before me, I am ready to realize what a far reaching step forward has been taken since the days of my boyhood; and when I compare the personnel of this with the old-fashioned "horse-doctor," who used to visit my father's farm. He generally took care of the horses on our place when he was not otherwise occupied in treating the "stalls," and he seemed to be generally recognized in the community as a sort of one-day stall himself. When I come here to-day, and find gathered in Indianapolis this great body of hundreds of men, who have dedicated their lives to this science, I am indeed forced to the conclusion that the world is progressing along other lines than those referred to by the political speakers of the present day. Indianapolis is so much accustomed to entertaining conventions that it requires one of unusual character to break a ripple on the surface, but I must admit to you that when there is gathered in our capital city this magnificent representation of this new profession, it is indeed an eye-opener to all of us.

When we were informed some few months ago that this national association was to hold its meeting here, the scope and magnitude of the gathering did not at any time impress itself upon our minds, but since we have seen the things which we have to-day, and heard the remarkable statements which have been made as to the progress of your great profession, we are forced to a realization of the importance of this great profession, and it becomes indeed a pleasure and delight to the people of the Hoosier capital, not only to welcome you here, but to know that you have selected our home town as the place for your gathering. A veterinary surgeon, in my mind, occupies a rather unique position before the American people. Some eight or nine years ago a mechanical genius of our land invented a horseless vehicle, and then arose up prophets upon all sides, none of whom have

proven themselves to have been a seventh son, or to have been born with a veil, gentlemen who said that the day of the horse had ceased, and that it would only be a limited number of years before vehicles propelled by horses would be such a scarcity as the automobile was when it started to run through the streets of this city, along in 1898 and 1899, but in spite of these direful prophecies, the use of the horse remains with us to-day, and I imagine will continue to remain with us as long as these great American people continue to be an agricultural people, because agriculture is the very basis of the prosperity of our land, and agriculture without the use of the horse could scarcely be carried on; consequently, the veterinary surgeon will remain with us as long as the draft horse is a necessity in our commercial life, and as long as the pet is to be found about the household. I well understand and know how serious a matter it has become where the household has become wedded to a particular pet, and I also well understand and appreciate how serious a matter it is in a case where the household has become wedded to a household pet, and we wake up some morning and find there is something the matter with that particular pet, which requires the attention of a veterinarian. If that pet is sick, it is almost a dead race to see how quickly we can get to the telephone to summon this professional man or that man to alleviate the sufferings of that pet, which means so much to the household. I am not comparing a household pet of that kind to the partner of my sorrows, but the household pet in the sense of importance, and it is only given as a relative illustration to demonstrate to you that so long as the American people continue to be a people who have some natural and wholesome impulses manifested in the love of dogs and ponies, and our other domestic animals which we have about the household, just so long will there be a demand for men of this profession.

Any following in life of importance, and any profession has a commercial side represented by the manufacturing side, and that in your case shows a great amount of inventive genius, skill and brains given to the careful manufacture of these beautiful instruments, such as I have seen down stairs this morning. These alone are evidences, not only that the profession has come to stay, but has come to be developed into a calling which knows the needs of the live stock interests of this country, and demands the respect of the people of this country.

I am glad indeed to know that you have come to Indianapolis. It is a beautiful city. I trust that you all may have an op-

portunity to visit its beauties while you are present with us here during the coming week, and I want you to feel that the hearts and homes of our people are open to you, and we extend to you in the broadest sense a true, genuine and hearty Hoosier welcome. I thank you.

After the hearty applause brought forth by Mr. Bookwalter's remarks had subsided, President Brenton requested Dr. John G. Rutherford to respond in behalf of the association, which he did in true Rutherfordian form, as follows:

Mr. President, Ladies and Gentlemen: It certainly gives me a great deal of pleasure to have an opportunity on this pleasant occasion to reply to so genial an address as that which we have just heard this morning from Mr. Bookwalter. I came all the way down here from Calgary, Alberta, at the base of the Rocky Mountains, on purpose to reply to the address of welcome, which was to have been delivered on this occasion by ex-Vice-President Fairbanks of the United States, and I had heard one or two expressions of regret during the last few hours on account of the fact that the distinguished ex-Vice-President of the United States was not able to be with us, but I am sure that if any member of this body had any regret at his absence, that regret has been completely obliterated by the exceeding geniality and cordiality of this address, to which we have all listened, from Mr. Bookwalter this morning. I feel sure that if the distinguished statesman had been here he could hardly have made a speech which makes us feel so thoroughly at home as the gentleman who took his place this morning. After all, that is the most important purpose and object of an address of welcome,—to make people feel at home in the city in which they happen to be for the time being, and I am sure we have no reason to regret, but rather every reason to congratulate ourselves upon our good fortune in the selection of the ex-Mayor to deliver the address of welcome to us this morning. We reciprocate very much indeed the friendly and cordial remarks of Mr. Bookwalter.

I could not help but think as he spoke of the partner of his sorrows that if we are to be looked upon as judges, and that if his speech to us this morning is any sample of his usual manner of address, that the other would be much more appropriate to the partner of his joys, but I am satisfied that Mr. Bookwalter has much more joy than sorrow in the relation to which he referred. If that were not the case, he certainly would not have been able to have delivered so genial and appropriate a talk as he has given to us this morning. He spoke of the progress of the

veterinary profession, and in a few brief words contrasted the difference between the old "horse doctor" and the modern veterinarian. In fact he appealed to my personal memories in this great state of Indiana, because some thirty-two years ago I wandered down here from the wilds of Canada into the state of Indiana and commenced the practice of my profession in what is now one of the most prominent cities of the Hoosier State. I can fully substantiate Mr. Bookwalter's memories because I think the facts to which he refers were going on quite extensively at about the same time as my own experience in this state. When I came to Indiana, although, of course, I owned and used the title of "Veterinary Surgeon," I found that nobody knew what it meant. (Laughter.) There was in the town in which I was located at that time, a gentleman who had a sign on his place of business. He was one of the old-fashioned type of "horse doctors" to which the Mayor referred. I need not tell you that I had rather a hard time. I was a bit of a curiosity in that Indiana town because I had a hat the style of which was not generally known in the town which I was located in, and which caused me to be looked upon with considerable curiosity in that particular part of the state. I think I had the only one of that style in the State of Indiana at that time. That was not the only peculiarity which I had. I had several other peculiarities. I remember that was only one. I used to use a tight cord to hold my unmentionables together, and I was a bit of a curiosity on that account. When I used to walk about the street, the girls of the town used to stand and look at me. I am afraid I was considerable in advance of my time in that place. (Laughter.)

One day there was an old chap, who was rather a dignified man, and who always wore a top hat and Prince Albert coat. He had once been in the East, and I suspect got his notions of dress from that quarter. He was in my office one day, and he says to me, "Doc, where did you come from, anyway?" "Well," I says, "I came from Canada." "Well," he says, "that is not much of a place, anyhow." (Laughter.) He says, "I was down in Niagara Falls once on an excursion, and I saw a place across the bridge, and I said to somebody, "What place is that?" They said it was Canada. So I went over and walked all over the dog-goned place, but there was not much to it, and it did not amount to anything, anyway." (Laughter.)

I came from Canada, and, as you can see, the old fellow's opinion of the place from which I immigrated was not very favorable. Between his opinion and the opinion of the towns-

people, whom I have strongly suspected of looking upon me as something of a freak, I can quite strongly substantiate what Mr. Bookwalter has said this morning about the profession in his early days, and I rather think from his description of the gentleman who came to his father's farm, he was rather superior to the general run of veterinarians in that day. We have progressed. We have gone along until we are at the present time a very substantial, a very reputable and respectable profession. We are improving. Another thing, we are able to corroborate the statement which the Mayor made this morning as to the fact that we are not going out of existence for quite a while yet, and that most of us that are in the profession to-day will probably die in it, unless we make a mistake and get into politics, either municipal or federal, in which case the end can readily be foreseen. (Laughter.)

There is, of course, a phase of the veterinary business which Mr. Bookwalter did not touch upon, and to which he did not allude, namely, that of veterinary sanitation. That particular phase of our work, as you all know, is coming to play a very great part in the practice of veterinary medicine. We all appreciate very much indeed the kindly remarks of Mr. Bookwalter with reference to the household pet. We hope that the domestic pet will be a long time in dying out of the hearts of the American people. We fully realize the serious responsibility of being wedded to one woman, and, as the Mayor has very artfully intimated, it is serious (Laughter) because, as we know, no one man can very well serve two masters. I know a fellow that tried it once, and he is now serving a term for bigamy (Laughter), and I feel, as I said before, that in the matter of Mr. Bookwalter, while he made the serious step of being wedded to the woman who was invited to wed him, I am sure that he certainly felt that she was not suffering any grievance on account of being wedded to only one man. (Laughter.)

I was greatly impressed with Mr. Bookwalter's reference to the little souvenir which he received down stairs this morning, and I felt when he told of the various uses to which that little implement could be put, that perhaps I ought to give him a word of warning, and as I was not quite sure that I would have the opportunity of giving it to him privately, I may be justified to take this big audience into my confidence, and give it to him in this public manner. I want him to avoid, if possible, the unfortunate mistake which a fellow made who was on a trip away from home. When he came home, his wife said to him, "John, did

you enjoy your trip?" "Oh," he says, "it was rather of a long trip all together, but that would not have been so bad, if I had not lost my luggage." "Lost your luggage? But how did that happen?" she said. "Oh, the cork got loose, that's all." (Laughter.)

Now then, ladies and gentlemen, we certainly appreciate to the very full the very kindly and hearty welcome which we have had this morning. I have had in common with a good many of you the opportunity of listening to a good many addresses of welcome in various parts of this continent. We have had them of all kinds. They have all been nice and friendly, and they have all been appreciated by the members of the American Veterinary Medical Association, but I have no hesitation in saying that the address that Mr. Bookwalter has given to us this morning will stand out even among the considerable number of eloquent, friendly and kindly addresses to which we have listened in different places in which our conventions have been held,—it will stand out by itself, as one of the best, if not the very best, to which we have ever listened. (Applause.)

On behalf of this association, Mr. Bookwalter, I desire to convey to you, and through you to your fellow citizens of the City of Indianapolis, our sincere appreciation of the cordial and fraternal welcome which you have accorded to us, and to express the hope that the cordial relations between this association and the people of Indianapolis, so happily begun, will always remain as friendly as they are at the present moment."

To say Dr. Rutherford's remarks delighted his audience, would be putting it mildly; as was attested by the rousing applause that followed; after which the president delivered one of the most wholesome and helpful addresses that the members have listened to in some time, and it is to be hoped that the younger members to whom he delivered some sound advice, will realize the importance of his remarks. The older members showed that they fully shared his views by their conduct at the several executive sessions.

President Brenton's Address.

Fellow Members of the American Veterinary Medical Association, Visitors, and the Ladies: In again acknowledging my appreciation of the great honor done me a year ago at Toronto in electing me to the highest office in the gift of the profession in America, I do so with a full sense of the responsibility which goes with that honor. I wish to emphasize what was said a year ago that the appreciation is all the greater on account of the

honor coming upon the anniversary of my majority, on the threshold of my Alma Mater, in the land of my birth, and largely by the assistance of my associate residents in the land of my adoption.

Ever since the Toronto meeting I have been trying to figure out why such an honor should be bestowed upon a humble member in the ranks, as it were, and long ago I came to the conclusion that it was not from any personal worth or any accomplishment of my own, but as a compliment to the Michigan State Association, as well as a tribute to the practising veterinarians, from whose ranks a presiding officer had not been chosen for a number of years.

I have thought, too, that it might be for the purpose of getting rid of me by putting me on the shelf, as so many of the ex-presidents have dropped out of service as soon as their term of office had expired. But I want to give you a fair warning right now that something else will have to be done to prevent me from meeting my associates at each anniversary, and returning the hearty hand-clasp, and hearing the kindly expressions which make life so much worth the living. At each anniversary some familiar face will be missed, for the Grim Reaper will exact his toll, and although the ranks will be filled by others, there are those who have so endeared themselves to us that their memories should ever be kept green by some permanent memorial. The Committee on Necrology will take proper notice of those who have departed this life during the past year.

This association is nearing its fiftieth milestone, and how best to commemorate that event has been the study of several of the members from the East, and it seems but proper the anniversary should be celebrated at the birthplace of the U. S. V. M. A., now the A. V. M. A. The question now is, how can we make the meeting most memorable? One way is by increasing the membership, which should be doubled in the next year, and that could easily be done if each one would constitute himself a committee of one and send in to the secretary at least one new name, and as many more as possible of his worthy associates. In that way we would be able to celebrate our golden anniversary with a membership of not less than 2,500. Let us all do our part, and even the officers, each, will have to get a hustle on to entertain the hordes which will be with them in 1913. The 1913 committee in their report will tell you how to do the rest.

The forty-ninth anniversary of this association has opened so auspiciously that I am led to believe that a wise selection as to

the location was made by the Executive Committee in choosing Indianapolis for 1912, it being near the center of population and easy of access from every quarter. With what is perhaps the greatest number ever assembled on the opening day, and with a real Hoosier welcome which had been promised us by the local committee a month ago, and emphasized by the kindly and earnest words of the speaker this morning, I am sure we can already anticipate a very pleasant time and a profitable meeting. We have had a gradual increase in the number of applications during the past few years. In looking over the report of the meeting of the U. S. V. M. A. for 1891, the secretary's salary, which was one hundred dollars per year, was increased to two hundred dollars. The income at that time was from seven hundred and fifty to eight hundred dollars, there being less than three hundred members. Dr. Hoskins, who was secretary at that time, spent considerable more than his salary attending different meetings in the interests of the parent association. He also sent out over five thousand communications of different kinds and nine hundred and fifty notices of the meeting. Then we were satisfied if the secretary's expenses did not exceed four or five hundred dollars so that there would be a balance of two or three hundred dollars in the treasury. At the present time we have a membership of approximately fourteen hundred, and the work of our secretary had been advancing during the past year and as proof of it just scan the program which has been prepared with its feast of good things for your entertainment and instruction, and a consequent increase in the duties of the secretary, and I would recommend in view of the greater importance of the coming meeting that the secretary's salary be increased to a sufficient amount to allow him to employ a permanent stenographer or assistant in the work of the office so that the same can be attended to promptly. We have an income of about $6,000 with fees and dues.

The President, Dr. Huidkoper, at the time I have referred to, recommended that applicants for membership should be fixed members of their County or State Association, which is now being done, and I believe it is a wise move.

I wish now to publicly thank all the officers of this association for the many courtesies extended, and to express my appreciation of the work done by the members of the various committees with whom my associations have been so pleasant during the past year. The Legislative Committee came under the direction of the able and energetic chairman, Dr. Hoskins, and has waged such a campaign at Washington in the interests of army legisla-

tion that they are still in hope that the bill giving rank and recognition to the Army Veterinarian may become a law in the near future.

That Dr. Hoskins has found out to his satisfaction where the opposition to our bill has been coming from for the past twenty years or more, and he has succeeded in smoking out the Military Department. If ever a committee's work deserved success, the Legislative Committee does this year, and recognition in some substantial manner should be given Dr. Hoskins for his unselfish work on that committee and for the time and money expended.

The Publication Committee deserve great credit for their work in getting out their reports in record breaking time.

The special committee on college investigation have accomplished a great deal with the small amount of money appropriated, and I am very glad to state that they are ready to report a steady improvement along this line.

I do not know whether the Committee on Veterinary Anatomical Nomenclature are ready to report, as the Chairman, Dr. Sisson, is in Europe, but I believe that an appropriation will be necessary to aid them in their work for the coming year.

That serum therapy does now and will in the future play a very important part in the prevention and eradication of disease I am satisfied, and that its use with the aid of sanitary science will within a few years' time be the means of controlling many of the infectious diseases, but greater care should be exercised in the manufacture and distribution of the same.

Among some of the later serum or vaccine used, I might mention that for the treatment of distemper in dogs, which is a boon to both the owner of our most faithful friend and the veterinarian who may have the treatment in hand. You will probably hear more later regarding the treatment of same from Dr. Ferry, who succeeded in isolating the germ of that fatal malady, canine distemper.

The Phylacogen, or modified vaccine, which is being used very extensively by the medical profession in the treatment of various diseases with very satisfactory results, is being introduced into veterinary practice, and I must say that the reports from some of our associates in the treatment of pneumonia and influenza and even in infected wounds have been quite remarkable.

I am very glad to note that through the work of one of our older members that the profession in England as well as Continental Europe are awaking to the fact that something may be learned even from the Americans. I am speaking now of Brother

Williams' operation for roaring, which he introduced into England and which is being practised so largely by Prof. Hobday, whom many of you met in Toronto last year, and has been taken up by the profession in Italy as well as the other countries of the old world; and I noticed lately in some report that the Russian government had sent some valuable stallions to Prof. Hobday to be operated upon.

That the profession in England have a more friendly feeling toward the profession in this country is evidenced by the reports received from over the water, and in this connection I might mention that in a letter received only yesterday from Prof. Hobday he expresses the hope that we may have a very successful meeting, and he would like very much to be with us, and he wishes me at the same time to call your attention to the International Veterinary Congress in 1914 to be held in London, and hopes that a large delegation from this association may attend that great meeting. I sincerely hope that a good number of us may be privileged to go to London at that time.

The meetings of the A. V. M. A. in the various states where they have been held, as a rule, have been productive of much good, and I have every reason to believe that the Indiana Veterinary Medical Association will have no cause to regret the great effort they have made in order to properly entertain this immense gathering, and I sincerely hope that the profession in Indiana will feel that having this meeting of the A. V. M. A. within their border has benefited the profession in their state.

I know that the profession in Michigan was greatly strengthened by your meeting in 1900, and we will be glad to try and entertain you when you feel that you can again meet in the City of the Straits.

Our association had a period when an unseemly struggle for official places, both elective and appointive, characterized our annual meeting. The getting of office for themselves or friends engaged time and thoughts of members to such an extent that the usefulness of this association as a scientific organization became of secondary consideration to many. So obnoxious had the political methods employed become, and so great was the perversion of the time of the meeting in the scramble for office, that our association ceased to attract new members or to hold the respect and co-operation of those who had joined for purely professional purposes.

So serious was the disruption of the legitimate work of the association through political methods of selecting officers that

this association framed into its organic law a provision making its ex-presidents, who are no longer eligible for elective office, a permanent committee on nomination, and by resolution expressly forbid nominating speeches.

Many of the newer members have no personal knowledge of the struggles to secure important places by ambitious individuals —to the very great scandal of this scientific body, and do not realize the beneficent influence of the present plan of nomination. It is very apparent to those who have long acquaintance with association affairs that our nominating committee has without prejudice endeavored to serve the very best interests of the association in its selections, and I commend a very careful study of the excellence of this plan of selecting nominees for office to those who have become members in recent years, before they shall enter into what seems to be a growing discontent with the present method because of the agitation of a few who are ambitious and seek to control through political methods, regardless of the baleful influence of such methods. I sincerely hope that the younger membership will take counsel of their elders in this organization, that we may go on with the better and more amicable methods of selecting officers.

Before closing, I wish to pay a compliment to the ladies, who have done so much, not only to increase membership in the association, but who have made our meetings better in many ways. I am glad to see so many of them present with us to-day. (Applause.)

The conclusion of President Brenton's address brought to a close the morning session, the first session of the forty-ninth annual meeting. The ladies having been present at this session, lunched with the gentlemen in the café of the German House, after which they took themselves off pleasure seeking, while the men sought out for themselves the particular one of the three sections in session, that appealed to their needs or desires; as at that time First Vice-President Moore was presiding over the section on Practice of Veterinary Medicine in Room A, under the directorship of Dr. H. D. Gill, Second Vice-President Van Es was presiding over the section on Surgery, in Room B, under the directorship of Dr. W. L. Williams, and Third Vice-President Jensen was presiding over the section on Sanitary Science and Police, in Room C, under the directorship of Dr. Charles H. Higgins. The section on practice had five excellent papers that were comfortably read and properly discussed; the section on surgery had three papers, and the section on sanitary science

had six papers, making a total of fourteen papers that were read and intelligently discussed during a half day session; a condition only made possible by the section system, and proved the efficiency of that system where the program is carefully arranged, and the sections properly handled. Tuesday evening offered two attractions, a reception at the Claypool Hotel and a general session in the auditorium of the German House, where the president listened to the reports of the executive committee, to the several officers' reports (secretary, treasurer and librarian), to the report of the committee on diseases, and of the delegates from the state and other local associations. A surgical clinic was on each morning, beginning Wednesday, from 9 to 12, while papers were being presented to each of the sections each morning from 10 to 12, so that those who did not want to give all their morning to the clinic could attend the clinic for an hour and then attend the section they chose for the next two hours. Each afternoon, beginning Wednesday, was given to a general session, which all attended together in the auditorium. There was also a general session on Wednesday evening which all attended, at which time election of officers took place. This session lasted until eleven o'clock in the evening, and was followed by a Dutch lunch and vaudeville in the Palm Garden of the German House. Thursday evening was devoted to the annual banquet. Friday with an all-day clinic, section work in the forenoon, and a general session in the afternoon, which was concluded by the installation of the officers for the coming year, brought to a close the most successful meeting in the history of the American Veterinary Medical Association.

The Clinic.

After the afternoon session on surgery in room B on Tuesday, 27th, the further work of that section was conducted at the Indiana Veterinary College in the form of a surgical clinic, which began at 9 a. m. on Wednesday, 28th, presided over by Fifth Vice-President Roberts, and under the directorship of Dr. J. W. Klotz. The amphitheatre furnished ample seating room, and with a large and small operating room, each provided with an operating table and plenty of floor room where horses could be operated upon thrown, a tremendous amount of clinical material was used to advantage. Another very helpful feature of the clinic was the lectures that were given by the operators, before, during and after an operation. Before the operation the

indications for its performance, the dangers and complications to be encountered and avoided, and the probable results to be expected; during the operation the operators stopped at the various steps in the operation, explaining what had been done up to that time and what the next step would be, etc.; after the operation an explanation as to what had been finally accomplished during the several steps, all of which was extremely interesting and instructive.

Case I.—Bay gelding; malignant tumor; operator, Dr. W. L. Williams, Ithaca, N. Y. Dr. Williams explained that the subject was about 10 years old, and that for about 12 weeks it had been noted that he had had some difficulty in respiration, enough, in fact, to make an operation necessary. Besides, he could swallow neither food nor water with any degree of comfort. Examination revealed a new growth in the throat about the size of a finger, situated between the epiglottis and the tongue. The animal was destroyed, a longitudinal section of the head made, exposing the tumor and confirming the diagnosis. Dr. Williams pronounced the tumor malignant, probably carcinomatous.

Case II.—Bay mare; fistulous tract in withers; operator, Dr. W. A. Axby, Harrison, Ohio. Dr. Axby explained upon examining the case that it was a chronic condition, which had never been operated upon, but that caustic had been applied at various times. Upon further examination it was shown that the tract extended down an inch and a half behind the scapula. After laying the tracts open they were packed with gauze, with the recommendation that the parts be kept clean with an ordinary salt solution, and that bacterins be given in increasing doses every four or five days.

Case III.—Light sorrel gelding; roarer; operator, Dr. J. H. Blattenberg, Lima, Ohio. The animal was cast and put under general anaesthesia; the throat shaved and washed, and tincture of iodine applied. Dr. Blattenberg then proceeded to perform the Williams' operation, using the Blattenberg burr. Dr. Blattenberg said he was frequently asked about stitching after the mucosa had been taken out, and said, "I do not stitch."

Case IV.—Four-months-old colt; operation for knuckling; operator, Dr. John W. Adams, Philadelphia, Pa. After an extremely interesting discourse on the condition and the indications for the operation, its probable results, choice of instruments employed, etc., the colt was secured in hobbles and laid on its side, and tenotomy performed, with result that the little animal put the foot flat on the ground on being released.

Case V.—Bay mare; roarer; operator, Dr. W. L. Williams. After an interesting talk on the operation, Dr. Williams operated on the left side, as the right side appeared to be all right, he explained. The mucosa was removed with the burr.

Case VI.—Bay stallion; scrotal hernia; operator, Dr. J. H. Blattenberg. Case explained and a talk on the condition and the operative procedures contemplated, by Dr. W. A. Axby. The horse, which had been under a general anaesthetic, revived within three minutes after ammonia had been placed to the nostrils, and walked to his stall.

Case VII.—Bay gelding; quittor; operator, Dr. W. L. Williams. Who, after explaining that he had been asked only that morning to operate, and the foot was not as clean as he would like to have it, so he would have to operate under antiseptic instead of aseptic conditions, proceeded to perform the Baer operation. In removing the horn over the lateral cartilages. it was found that the laminae were badly diseased, and over a large area were absolutely destroyed, the coronary band was so badly diseased it had to be cut away in order to get the part clean, and the lateral cartilages had nearly all disappeared, due to necrosis. At the completion of the operation, Dr. Williams stated that the case gave promise of a fair recovery, but that the coronary band would be considerably blemished.

Case VIII.—Sorrel gelding; necrosis of ligamentum nuchæ; operator, Dr. W. A. Axby. The necrotic tissue was removed and the wound packed and sutured and the animal released apparparently suffering no discomfort.

Case IX.—Bay stallion; cryptorchid; operator, Dr. J. H. Blattenberg. The animal for this operation was placed in the centre of the floor of the amphitheatre, where the operation was performed by Dr. Blattenberg in a manner that proclaimed him a past-master at the work.

Case X.—Black mare; shortened tendon; operator, Dr. L. A. Merillat, Chicago. Ill. Dr. Merillat explained that this condition was due to inflammation of the carpal joint. The pain of synovial inflammation, or of ligamentous inflammation, had caused the joint to be held in a state of flexion, and to accommodate the new position, the tendinous structure is shortened. "The operation we are going to perform to correct this condition is known as carpal tenotomy," he said. After the operation, Dr. Merillat called attention to the fact that the leg had taken a pretty normal position. "It is a better leg than the opposite one," he said, "but you will notice half an hour from now, in the stall,

that the animal will find the same old position, and the application of a brace will be necessary to effect a cure."

Case XI.—Bay gelding; roarer; operator, Dr. L. A. Merillat. "Here is a horse that will probably not be cured by the operation," Dr. Merillat said, explaining that roaring in this case was due more to damage to the trachea, than to the larynx. "This is more of a clinical case than a practical case. Having the horse under anaesthesia, we can observe this condition." The Williams' operation was performed.

Case XII.—Bay gelding; operation for kick wound on inner aspect of tibia; operator, Dr. W. L. Williams. The operator stated that he understood that the animal had been kicked, and that it had been followed by necrosis with a sequestration of bone imbedded in the tibia. Proceeding with the operation, Dr. Williams found a fistula running behind the tibia, there was some necrotic tissue. After the operation, the wound was packed with iodoform. Dr. Williams stated that he had gotten to the bottom of the fistula, and consequently the case should do well.

Case XIII.—Bay gelding; nail puncture that had infected the foot; operation, resection of flexor-pedis tendon; operators, Drs. W. A. Axby and J. H. Blattenberg. Dr. Axby gave a grave diagnosis, explaining that the operation should be performed earlier, before septic changes have become so far advanced. The doctor had very little hope during the operation from the advanced necrotic condition, but upon completing it, stated there might be a chance. It was an excellent case for demonstration of tissue destruction from a nail puncture.

Case XIV.—Bay mare; ovariotomy; operator, Dr. H. Fulstow, Norwalk, Ohio. The doctor performed vaginal ovariotomy on a five-year-old mare, with colt, the mare being a nymphomaniac. She was high spirited and difficult to control, but the operation was finally performed satisfactorily.

Case XV.—Bay mare; ovariotomy; operator, Dr. H. Fulstow. The doctor found some difficulty to get one of the ovaries, as the mare was high-strung and the ovary was enveloped in the peritoneum. Dr. Fulstow explained that the ovaries were very cystic. This mare was also a nymphomaniac.

Case XVI.—Bay gelding; hydrocele; operator, Dr. George R. White, Nashville, Tenn. Dr. White said, "This horse was sent here for operation for scortal hernia, but it is nothing more than an ordinary water sac, or water bag. It is one of the frequent sequelae to castration of the horse, but it is a *very* frequent sequel to castration in the mule. The presence of a water sac after cas-

tration, however, reflects as much on the veterinarian's ability as any one operation he can do." The operation completed, the horse (which had been cast with the old Conkey casting harness, 27 years old) was released and immediately got up and walked to his stall.

Case XVII.—Light sorrel gelding; quittor; operator, Dr. R. C. Moore, Kansas City, Mo., assisted by Dr. Geo. H. Roberts, Indianapolis, Ind. This was an exaggerated case of quittor; the operation was performed on an operating table in one of the smaller operating rooms of the college; the animal having been given two drachms of cannabis Indica in the jugular vein a short time before the operation. The operation was successfully performed and the horse seemed more comfortable after it.

Case XVIII.—Bay gelding; roarer; operator, Dr. J. N. Frost. Animal was cast upon the floor of the amphitheatre, and the Williams' method followed.

Case XIX.—Bay mule; arthritis; operator, Dr. W. J. McKinney, Brooklyn, N. Y. This operation for arthritis in the shoulder joint was done by puncturing to the condyle of the humerus. Drainage was established and the arthritis reduced successfully.

Case XX.—Bay mule; fibroid tumor; operator, Dr. Geo. R. White. This tumor was situated above the sternum in an aged mule. Two drachms of cannabis Indica was injected into the jugular vein, and the animal placed on an operating table. Two lateral incisions were made close to the base of the tumor, the adhesions divided, and the tumor, which weighed between 15 and 20 pounds, successfully removed, but the animal died before he could be placed on his feet, which was the only death that occurred during the entire clinic, which extended over several days.

Case XXI.—Heifer; ovariotomy; operator, Dr. John W. Jameson, Paris, Ky. The heifer was in calf; the operation was successfully performed.

Case XXII.—Heifer; ovariotomy; operator, Dr. H. M. Manly, Dayton, Ohio. This operation differed in interest from the last one only in the demonstration of the x-stitch by Dr. J. W. Klotz.

Case XXIII.—Bay gelding; handling of float; operator, Dr. C. C. Brown, Memphis, Tenn. Dr. Brown gave a demonstration on handling a float in the mouth of a horse, also in making an examination of a horse's mouth. The doctor came upon a split molar on the right side, sticking out into the mouth, which

he proceeded to remove successfully with a pair of forceps—not using any speculum.

Case XXIV.—Dapple-gray gelding; roarer; operator, Dr. John W. Adams. A tracheotomy tube had been inserted in this horse's trachea about two weeks previously. Horse was cast and chloroform administered, and the roaring operation performed.

Case XXV.—Bay gelding; median neurotomy; operator, Dr. John W. Klotz, Noblesville, Ind. This operation for lameness in the knee joint was quickly and successfully performed.

Case XXVI.—Bay gelding; fistula of poll; operator, Dr. J. H. Blattenberg. This operation was performed with the horse standing on the floor of the amphitheatre, an incision being made, and drainage provided for. After the pus had been drained out, peroxide was applied and the wound packed with sterilized gauze and sutured.

Case XXVII.—Bay mule; hernia; operator, Dr. J. H. Blattenberg. Animal was cast on the floor of the amphitheatre; there were no adhesions, so that the operation was a simple one, and was quickly and successfully performed.

There were also a number of minor operations and procedures on horses' mouths and on small animals, without lectures, making 56 operations in all. And, besides, there were a number of cases that were not reached, which Dr. Klotz operated upon the following Monday. Altogether, it was the most instructive clinic that has ever been held in connection with the A. V. M. A., and we believe in connection with *any* association.

The great success of the Indianapolis meeting was due as much to the organized system of conducting its affairs as to any other one factor, and the officers of the association and members of the local committee cannot receive too much praise for the formation of so excellent a program as was presented, and the orderly and systematic manner in which it was carried out. The disappointment of not being able to discuss the papers, which was experienced with the large program presented last year, was, so far as we know, entirely eliminated this year. The evening sessions on two evenings materially assisting in getting off much of the routine business.

The ladies were well entertained and share with the men the opinion that a Hoosier welcome is one of the most whole-souled and heartiest they have experienced, and one that will linger pleasantly in their memories for a long time to come.

COMMITTEES APPOINTED BY PRESIDENT MOHLER FOR 1912-13.

GENERAL COMMITTEES.

Executive—A. D. Melvin, Chairman; Sesco Stewart, Joseph Hughes, F. Torrance, H. D. Gill, D. F. Fox.

Intelligence and Education—E. A. A. Grange, Chairman; Pierre Fish, C. H. Stange, W. B. Craig, R. A. Archibald.

Diseases—V. A. Moore, Chairman; L. Van Es, A. T. Kinsley, K. F. Meyer, C. M. Haring.

Legislation—W. Horace Hoskins, Chairman; W. G. Hollingworth, J. P. Turner, James Robertson, F. A. Bolser.

Finance—Thomas A. Sigler, Chairman; H. Preston Hoskins, A. S. Cooley.

Publication—R. P. Lyman, Chairman; R. W. Ellis, George H. Hart, J. H. Blattenburg, Ward Giltner.

Necrology—O. L. Boor, Chairman; S. Brenton, J. G. Wills, A. H. Baker, A. Bostrom.

Resolutions—W. H. Dalrymple, Chairman; E. H. Shepard, George A. Johnson, S. H. Ward, George B. McKillip.

SPECIAL COMMITTEES.

Revision of Veterinary Anatomical Nomenclature—S. Sisson, Chairman; I. E. Newsom, S. L. Stewart.

Veterinary College Investigation—Tait Butler, Chairman; M. H. Reynolds, George W. Dunphy.

Agricultural College Education—A. M. Farrington, Chairman; Paul Fischer, James B. Paige.

Advertisements of Veterinary Remedies—N. S. Mayo, Chairman; C. A. Cary, S. B. Nelson.

Directors of Section Meetings—George H. Glover, Section on Medicine; L. A. Merillat, Section on Surgery; Chas. H. Higgins, Section on Sanitary Science and Police.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION.

This association convened at the A. and M. College, Agricultural College, Miss., September 6, 1912, this being the sixth annual meeting of the association. Though the session covered but one day, it was of unusual interest because of the interesting demonstration and the tubercular specimens and hog cholera serum prepared at the college. The morning was devoted to a

paper from Dr. J. A. Beavers on hog cholera and the results of serum treatment.

Dr. E. M. Ranck, State Veterinarian, gave a public demonstration of the simultaneous method of immunization of hogs against cholera. Drs. Oliver, Beavers and Ewing reported their good results with the use of this method.

The afternoon part of the session was called at 1.30 o'clock, after which followed the reading and discussion of a paper by Dr. B. M. Leigh on milk and dairy inspection. It was discussed by Drs. Oliver, Ranck, Ewing, Beavers, Edwards and Ferguson.

Dr. E. I. Keller then read a very instructive paper on gastric flatulence. This was discussed by Drs. Norton, Beavers, Oliver, Ranck and Roberts.

Many addresses were made complimentary to the President of the College, G. R. Hightower, and the Live Stock Board of this State upon the biological work along veterinary lines made possible by urgent and persistent efforts of the Board of Live Stock Commissioners and the State Veterinarian, Dr. E. M. Ranck.

Three new members were elected and received into the association: Dr. E. I. Keller, Okolona; Dr. J. A. Barger, Greenville; Dr. G. F. Smith, Macon.

Officers elected for the coming year: President, Dr. O. M. Norton, Greenville, Miss.; Vice-President, Dr. B. M. Leigh, Meridian, Miss.; Secretary and Treasurer, Dr. W. P. Ferguson, Grenada, Miss.

The next meeting will be held at the Agricultural and Mechanical College, Agricultural College, Miss., in September, 1913.

W. P. Ferguson, Secretary.

Dr. J. C. McNeil Dislocates Shoulder.—We read in the Pittsburgh *Chronicle Telegraph*, of September 23 that Veterinarian J. C. McNeil, superintendent of the food inspection bureau of that city, slipped and fell down several steps, dislocating his left shoulder. We extend our sincere sympathy to the doctor, and hope to report him recovered in our next issue.

Dr. J. J. Cranwell, Clarksburg, W. Va., writes in renewing his subscription: "I could not think of getting along without the Review! Yours for a successful year."

NEWS AND ITEMS.

Forage Poisoning or So-Called Cerebro-Spinal Meningitis of Horses.*

The Cause of the Disease.—During the last five months numerous reports have been received by the Bureau of Animal Industry relative to the existence of forage poisoning in various sections of the United States, particularly in Louisiana, West Virginia, Kansas, and Nebraska. It has usually occurred when a hot, dry period has been followed by rains, or during wet seasons, especially those which are characterized by frequent rains alternating with hot sunshine, producing a damp sultry atmosphere. Such conditions are most favorable to the production of molds, and all outbreaks that have been investigated by the Bureau have been traced to the ingestion of unsound or moldy forage or feed, or to the drinking of water from wells or pools containing surface water drained through decomposed and moldy vegetation. The disease has been shown to be due to eating damaged ensilage, hay, corn, brewers' grains, oats, etc. Horses and mules at pasture may contract the disease when the growth of grass is so profuse that it mats together and the lower part dies and ferments or becomes moldy. No specific organism or virus has yet been found which can be considered as the cause of this disease.

How the Diease May be Recognized.—The so-called cerebro-spinal meningitis of horses being an entirely different disease from that which occurs in man, the symptoms as well as the cause are distinctly different. In the most rapidly fatal attacks death takes place in from 5 to 48 hours. Such cases begin with violent trembling or stupor and extreme weakness, or with staggering gait, partial or total inability to swallow, impairment of eyesight, followed by partial or complete paralysis, inability to stand, with marked delirium, during which the animal lying flat on its side becomes violent and knocks and bruises its head. In the second form of the disease the same line of symptoms may be noticed in a milder degree. Difficulty in swallowing, slowness in chewing the food and inability to switch the tail are observed. Breathing becomes heavy and noisy, and delirium may develop with stiffness of the spinal muscles or partial cramp of the neck and jaws. Death occurs in from 6 to 10 days. In the

* Circular letter issued by the United States Department of Agriculture, Bureau of Animal Industry, Washington, D. C.

last or mildest form the lack of voluntary control of the limbs becomes but slightly marked, the power of swallowing never entirely lost, and the animal has no fever, pain, or unconscious movements. In those cases which get well the animal generally begins to improve about the fourth day and goes on to recovery. One attack does not protect against a second attack, as horses and mules have been known to have the disease two or three times.

How the Disease May be Prevented and Treated.—The first principle in the treatment of this disease consists in a total change of feed and forage. Horses kept in the stable should be fed with sound forage and grain from an uncontaminated source, even if such feed has to be brought from a distance. Horses that have become affected while at pasture should be removed from the field in which they have been running. The animals should be brought to the barn or corral and fed on wholesome and clean feed and forage. The water, unless from an unpolluted source, should likewise be changed.

At present this preventive treatment is the only satisfactory method known for checking the disease, as all medicinal remedies used have been unsatisfactory in the vast majority of cases. The first indication is to empty the bowels and remove the poisonous products, but on account of the difficulty in swallowing, an aloes ball or Glauber's salt is hard to give. In fact no remedy should be given by the mouth if the throat is paralyzed, as pneumonia is liable to result. Fifteen grains of barium chlorid injected into the jugular vein, or 2 grains of eserin under the skin, if the animal is not too greatly depressed, will usually act promptly. Intestinal disinfectants such as calomel, salicylic acid, and creolin are also used. If much weakness is shown and the temperature is below normal give aromatic spirits of ammonia, digitalis, alcohol, ether, or camphor. Rectal injections of warm water are good, and warm blankets wrung out of hot water may also be applied to the body. Subsequent treatment should consist of 2-grain doses of strychnin twice daily, or a mixture of 2 drams tincture nux vomica and one-half ounce of Fowler's solution given at one dose, and repeated three times daily, to combat the effect of the poison upon the nervous system.

Report on Horse Plague in Nebraska, from Dr. A. Bostrom, State Veterinarian.

From Secretary Ferguson, of the United States Live Stock Sanitary Association, we received the following; including State

Veterinarian Bostrom's report to him, which Prof. Ferguson has issued in the form of a bulletin, to the members of the U. S. L. S. S. A.:

BULLETIN.

"The following letter from Dr. A. Bostrom, State Veterinarian of Nebraska, gives the most definite information we have been able to secure regarding the disease affecting horses in Nebraska and Kansas.

Lincoln, Nebr., Sept. 18, 1912.

"Prof. J. J. FERGUSON,
Chicago, Ill.

"DEAR SIR—The epizootic disease among horses in Nebraska extends over two-thirds of the state. Horses take the disease in the sand hills and dry sections as well as in the low and damp sections. I know of a few cases which have been kept in the barn on dry feed for three weeks, but I know of no livery horses affected as yet, and very few horses in the large cities are affected. We know absolutely nothing concerning the nature, cause, treatment or prevention of this disease.

"The disease is very fatal, *not more than 5% recover,* and these few recoveries, in my opinion, could not be claimed to be due to any treatment. It attacks horses of all ages, but mostly young horses between two and six years old. Most of the horses die within 48 hours, a few linger for a week or more, and some die in about 12 hours.

"Derangement of the central nervous system is shown in the earliest stage, such as somnolence, stupidity, muscular tremors of the face and neck, grinding of the teeth, paralysis of the muscles of deglutition, and generally of one side of the head and neck, later muscular inco-ordination of the limbs, falling down and generally remaining flat on the side without showing any evidence of pain. Some exhibit rabiform symptoms. The visible mucous membranes are congested with petechia, especially on the membrane nictitans. Temperature in the early stage is generally between 103 and 106, respiration and pulse nearly normal. Later temperature goes down, respirations increased and abnormal, pulse decreasing and at last imperceptible.

"Post mortem lesions show evidence of inflammation of the brain, spinal cord and also of the meninges, hemorrhagic infarcts in the lungs and petechial hemorrhage in the spleen, yellowish infiltration of the connective and fat tissues of the body.

"Hoping that this will give you the desired information, I remain,

"Yours truly (signed) A. BOSTROM."

AMERICAN VETERINARY REVIEW.

NOVEMBER, 1912.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, September 15, 1912.

GENERAL PARALYSIS IN ANIMALS.—At any rate "*our researches in the domain of comparative pathology demonstrate that in one animal another virus besides the syphilitic can, by its localization on the nervous centers, promote a series of lesions and of symptoms identical to those characteristic of general paralysis in man.*"

Those were the conclusions of a communication made by Prof. G. Petit, of Alfort, before the *Société de Pathologie Comparée,* after relating some of the results he had obtained and of the observations he had made in his researches on the Comparative Pathology of the nervous system and principally in dogs affected with distemper, in which the virus localizes itself frequently on the important organs that compose it, the nervous symptoms presented by the animals thus affected varying naturally according to the importance and the seat of the lesions and resulting from the localization of the virus, which like that of rabies has, though to a lesser degree, the property of fixing itself upon the nervous centers. And it is thus that are observed in different subjects chorea, paralysis, epilepsy, etc., or even true *dementia,* with or without auto-mutilation, which is general paralysis and which must be understood in the same sense as it is in man, viz.: *general paralysis of intellectual functions.*

What a progress! When up to this day this disease was exclusively belonging to human species, here it is met with in an animal, in dog.

The demonstration of the existence of the disease in dogs is based by Professor Petit on the very careful study of the symptoms and of that of the lesions which as in man are those of *diffused sub-acute meningo-encephalitis.*

The predominating symptom of this affection, that which veterinary clinicians have, it seems, so far not recognized or interpreted in its true character, is the *gradual loss of the intelligence.* The memory is becoming obscure, the senses become blunt or abolished, and the animal is taken with indifference and automatism.

The judgment may be disturbed from the start. Is not the case of the dog which beats itself to death against the iron fence which separates him from another animal which he wishes to attack, a most significant illustration?

Again, the animal does not answer any more to the call of its name, he does not recognize his master; he falls into a kind of idiotism, like people affected with general paralysis. Sometimes nervous agitation or again stupor is observed. The former, at times characteristic in the clinical onset of the disease, is accompanied with change in the character; the animal becomes surly, cross or even ugly; but most ordinarily he falls in a state of stupefied dullness that lasts to the end. Cases of auto-mutilation can also be observed. Petit has seen it in a dog and in a hyena. Both of these animals had meningo-encephalitis.

Troubles of the motors may also appear from the beginning, due to either encephalic or medullary lesions. Patellar reflexes are exaggerated. There are generalized shiverings. The equilibrium and the moving are often unsteady. Cerebellous hemiatrophy added to the meningo-encephalitis has provoked circus motions in the animal.

Special and general sensorial sensibilities are soon diminished or even abolished. The external world does not exist any more for the animal. Ocular troubles are not always present. Pu-

pillar unevenness and myosis have been observed. Some animals bark no more, not because of the loss of voice, but by pacific disposition. Others seem to become deaf. The evolution of the disease takes place without fever, and the cephalo-rachidian fluid reveals an undoubted lymphocytosis.

Anatomically the nervous lesions are diffused, spread on the cerebrum they extend to the cerebellum, the bulb and the spinal cord; in other words, in the entire neuvrax. They are of subacute inflammatory nature and affect principally the pia-mater and the blood vessels; of course the clinical manifestations vary according to the extent and the severity of the lesions as well as their localization upon the segments of the nervous system. To the symptoms of cerebral order are associated cerebellous, medullary and sometimes bulbous manifestations.

Taking into consideration the clinical picture that he has thus reviewed and the anatomo-pathologic investigations he has made, Prof. Petit considers that great analogy is sufficiently demonstrated between the disease of dog considered as it has been and the general paralysis of man, and that both are equally due to diffused meningo-encephalitis with simultaneous development of lesions in the central nervous structures.

* * *

Lympho-sarcomas.—The diagnosis of the nature of some malignant neoplasms is, according to all writers on general pathology, the object of great difficulty, at least under many circumstances, or only unless an histological examination comes to the aid of the surgeon. But even in this condition there are instances where this can be reached only as one of the final steps of post mortem.

To be sure, this is, generally speaking, as clinical records have already given some essential points, which help the suspecting operator. The frequent appearance of those growths in given regions, in special organs or tissues, etc., are sometimes sufficient to suggest their nature. And on that account any fact which

may bring light on the subject and permit one to be almost positive as to the nature of a malignant growth is of utmost importance.

And such is the case which I found in the résumé of a clinical lecture by Prof. Moussu relating to *lympho-sarcoma of the neck and entrance of the chest in bovines,* where the learned professor made his diagnosis presented to him by the peculiar fact that he had met a few similar cases, almost exactly alike, not only in the manifestations of the tumor, its location, its aspect, its accompanying symptomatology, but also by its general effect on the organism, viz.: a more or less rapid emaciation with fatal cachectic condition ending the miserable suffering of the diseased animal in death.

Briefly recorded, the case was that of a cow, which had a tumor, which in a month had reached very large dimensions and involved the lower half of the neck. It was nearly symmetrical and localized to the pre-tracheal region. It was hard, painless, rather bosselated and gave the sensation, when one tried to move it, of a mass, not adherent to the cervical axis, but enveloping all the pre-vertebral organs, including blood vessels, nerves, trachea, oesophagus and pre-tracheal muscles.

Besides this condition of the neck, there was another symptom, which manifested itself from the very beginning of the apparition of the swelling and seemed to belong to the pathogeny of the disease, viz.: a permanent tympanitis, which, although relieved by puncture of the rumen, returned very rapidly after every operation. All the other apparatuses presented nothing abnormal.

A big local lesion and great digestive trouble were all that the animal presented, and they would prove sufficient for the learned professor to announce his diagnosis, which had been confirmed by microscopic examination. It proved an important fact —every one will know—of course the importance of this case is brought out only because of the satisfaction that such may prove to a practitioner, clinical scientific satisfaction—nothing else, the end being always the same. Even surgical interference, impos-

sible in a similar case, might be useless, and it is probable that a medical treatment would not be different.

Recently Wassermann has announced the recovery of experimental cancer of mice with intravenous injections of seleniate of soda and eosine. This was tried by Moussu on his cow. For three days only, as she died. The treatment was too short to expect any change in the general condition of the animal, but it removed the tympanitis. However, in another animal, affected with the same neoplasm and having also permanent tympanitis, intravenous injections of seleniate gave also spontaneous relief to the gastric troubles from six to twelve hours after the injection, but between thirty-six to forty-eight hours after, the tympanitis returned.

* * *

About Stijfziekte and Lamziekte.—Dr. A. Theiler, in the *Agricultural Journal* of the Union of South Africa, of last May, has written an article bearing some relation on these two diseases of that country, referring and reviewing the present knowledge of those affections in which, like rickets, osteomatasion, osteoporosis and pica, the absence of phosphate of lime in the skeletal system of the affected animals has been considered as accepted and proved as the pathological cause and because similar deductions have been made also with regard to the South African diseases above designated.

Practical notes, addressed to agricultural people, they have been issued after careful consultation with such publications as Hutyra and Marek's "Spezielle Pathologie und Therapie der Haustiere," Abderhalden's "Physiological Chemistry," and Ostertag and Zuntz's publication on "Pica" or *abnormal craving in cattle.*

Passing then briefly and successively a review of the symptomatology, post-mortem lesions, etiology of rickets, of osteomalacia, of osteoporosis and of pica, and after relating the experi-

ments made for investigations referring to this last disease by the Prussian Government, the author presents the following conclusions and comparisons:

1. There exist several diseases affecting the skeletal system, in which a deficiency of phosphate of lime is accepted, but these diseases do not seem to be identical either in the same or different species of animals.

2. It has been proved that by feeding certain animals with foodstuffs poor in phosphate of lime, a disease of the skeletal system can be produced both in young and adult animals.

3. It has, however, not been proved that the absence of such salts in foodstuffs produce the diseases known as rickets, osteomalacia and osteoporosis.

4. It has been shown that even the substances, of which a deficiency is considered to be the cause of the disease, can produce a disease when given in excess (phosphoric oxide), and it has been further noted that various causes must be responsible for the condition known as osteomalacia and rickets.

5. There diseases must be considered to be due to a cause directly or indirectly affecting the bony tissue whereby the metabolism of these parts becomes so affected that the lime salts are cast out as wasted products.

6. Rachitic and osteomalatic affections present themselves by general symptoms of malnutrition and indigestion, by swelling of the joints, particularly those of the distal ends of the legs, by deformation, by stunted growth, by brittleness of the bones and by softening of the bony tissue.

7. Some of the disturbances of the metabolism of the skeletal system are preceded and accompanied by nervous symptoms, such as depraved appetite and abnormal cravings (osteomalacia and pica).

8. Comparing the descriptions of rickets and osteomalacia with the form of stiff-sickness in cattle, described by Hutcheon, a certain resemblance can be noted.

9. It has been shown with certainty that at least one of these diseases (with abnormal craving as the main symptom, and char-

acterized by the stunted growth of the animals) is due to toxic substances in the vegetation of certain soils, the toxic being of a cumulative nature, and its presence in the herbage being dependent on climatical conditions (pica).

10. The disease lamziekte, as described by Hutcheon, has in common with osteomalacia, only the symptoms of depraved appetite and abnormal craving and none of the symptoms pointing to lesions in the skeletal system.

11. It has been proved that the toxic principle contained in the hay which caused "pica" was dependent on the growth of the grass and on certain climatic conditions; and that the toxic principles could be destroyed by treating the hay in various ways.

12. It has been proved that the supply of salts and phosphates to prevent pica due to vegetable poisoning was of no avail.

13. It appears that the symptoms of abnormal craving can be considered to be indicative of some intoxication with vegetable matters not yet known; and it appears further that several kinds of toxins exist which are responsible for the lesions of osteomalacia and pica.

14. The suggestion by Robinson that the *stijfziekte* he observed in the coastal districts of the Cape was connected with the sour condition of the veldt in that part of the country, finds an analogy in the causes of osteomalacia and pica.

15. The fact that cattle show *lamziekte* only after they have been for some time, even many months, on a reputed *lamziekte* area before they began to develop the abnormal craving and still later the disease, has a certain resemblance to results with the feeding experiments of hay made in Germany in connection with pica.

16. Leaving the pathology out of the question, there is no other disease which, in its etiological features, has so many points of resemblance to *lamziekte* as the pica which was studied in Germany by Ostertag and Zuntz.

* * *

Influence of Heat upon the Young.—Investigators in pathology must have recourse to comparative experimentation to solve in many instances problems relating to human medicine. The experiments made and related lately by MM. Schreiber and Dorlencourt, concisely considered in the *Presse Medicale,* are another evidence of this great truth.

All those who practice pediatry know of the dangers of heat on the nursing child, but differ in their opinions when comes the time to explain the noxious influence. So as to attempt to solve some points in discussion, the above named gentlemen have thought that in submitting young animals to the influence of heat, with varying conditions of temperature and feeding, they might succeed in elucidating some of the obscure points of the question.

They selected for their experiments puppies just born and placed them in a Roux autoclave. In a first series of experiments beginning by the temperature of the room, they gradually increased it, slowly, up to 40 degrees C. Some of the pups were fed exclusively on the mammae, others were raised artificially. In a second series of experiments they tried to realize the heat strokes in placing directly the subjects in the autoclave where the heat had been raised to 50 degrees.

From the series of the experiments the following general conclusions were drawn:

I. The Etiological Point of View—

a. Heat, *by its exclusive direct action,* is liable to promote accidents upon young subjects and the nocive influence of the heat is so much more marked that the external temperature is higher.

b. Subjects, *fed at the mammae,* are exposed to the accidents due to heat, as well as those fed artificially.

c. *Dampness of the air* seems to reduce the resistance of the subjects.

II. The Symptomatological Point of View—The authors have reproduced exactly the three classical forms admitted by Dr. Lesage.

a. They have succeeded in producing a *heat stroke,* rapidly

fatal. The symptoms observed were: excitement followed by depression, dyspepsia, hyperthermy above 43 degrees. They have not observed any digestive trouble.

b. In dogs exposed to 20 degrees temperature they have observed that the heat would produce a fever and agitation accompanied with dyspnea and loss of flesh. In most cases digestive troubles were absent. A long exposure to temperature above 30 degrees would produce a notable kind of arrest in the growth of the dog. A temperature of 40 degrees is rapidly fatal.

c. Three of the dogs artificially raised, besides the preceding symptoms, presented some digestive troubles, such as vomiting and diarrhoea.

III. The Therapeutic Point of View—The writers have noted the action evidently beneficial of immediate fresh balneation, specially in cases of heat strokes.

Those experiments can surely prove interesting to many veterinarians, as they present facts that can be advantageous to know in the point of view of raising valuable young animals.

* * *

Bibliography.—Dr. Giovanni Roncaglio, first assistant at the Institute of the Royal University of Modena, has done me the compliment of his work on the etiology, clinic and serodiagnosis between human, bovine and aviary tuberculosis. (Rapporti eziologici, clinici e sierodiagnostici fra *Tuberculosi umana, bovina, aviaria.*)

Attached in his professional duties to the High Royal School of Veterinary Medicine, Dr. Roncaglio has dedicated his work to the director, Prof. Boschetti, as a token of his friendship and appreciation of his paternal affection, and then entered in the consideration of his subject, which he has divided in two parts.

The first begins with a concise history relating to the knowledge of tuberculosis starting with the works of Hippocrates and gradually following it to Laennec, Broussais down to Villemin, Chauveau, Perroncito and many others, arrives to the

discovery of the long searched microbe by Robert Koch's discovery which justified his affirmation "*without the bacillus of tuberculosis there is no tuberculosis.*"

After this interesting review Roncaglio completes this first part by considering the work done at the Congress of London in 1901, that of Paris in 1905, of Washington in 1908, and after presenting the various views entertained on the duality of the microbe, referring to the long discussions between Nocard, Arloing, Koch and others, alluding to the modifications that it may be met in, according to various surroundings, and according to the different species of animals and also of cold-blooded animals, he presents his conclusions and enters into the second part.

In this the author has given his attention to different interesting points. The deviation of the complement, the reaction of Ascoli, the passive anaphylaxis, occupy the balance of the 187 pages of these valuable contributions.

The bibliographic list which is published at the end of the work and presents references to no less than 295 names, shows the lots of researches made by Roncaglio and brings before the reader of to-day the work done by many on tuberculosis, its causes, its clinical aspect, its pathology and last but not least its sero-diagnosis.

* * *

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A. L.

AMERICAN VETERINARY MEDICAL ASSOCIATION 1913.

With the date of the next annual meeting of the American Veterinary Medical Association in New York fixed for September 1-2-3-4-5, 1913, the work of preparation for the fiftieth anniversary of the organization of the association has actually begun, and the local committee and sub-committees from this time forward will be busily engaged formulating plans for the celebration that is to mark the half century of veterinary progress in America. It is not possible for us to do more than announce the date at this time and to direct attention to a communication from President Mohler to the Veterinary Profession of America on page 233 of this issue, but we hope that each succeeding issue will record some step in the progress of the work of the committees who have it in charge.

"HORSE PLAGUE" SUBSIDES.

While the general facts in regard to the so-called "horse plague" in Kansas and adjacent states remain as published in our October number, much interesting data accumulated by the investigators in the field has since been received, going into the minutiae as to the causative factors, possibility of infectiousness, etc.; although general reports never seemed to suggest that the condition was infectious, but seemed rather to point to the forage as the source of the trouble and the direct medium of transmission to each individual. That fact was borne out by the report

of the Bureau of Animal Industry of the United States Department of Agriculture, as published in our last issue, showing that horses not on pasture did not develop the disease (recommending for that reason the taking up of horses and feeding them dry feed in the stable), and is further confirmed by the fact that the cases became perceptibly less after the heavy frosts set in (new cases practically ceasing to develop after the first week in October), so that the "horse plague" in Kansas may be said to have subsided. Believing, however, that a careful, conscientious, unbiased discussion of this condition in detail, by one whose opinion is highly esteemed, will be interesting to our readers, we have published a letter from one of the REVIEW's collaborators who spent sixteen days in the field investigating the disease, holding post-mortems on forty cases. This letter will be found in our correspondence department, beginning on page 234.

AUTOTHERAPY INTERESTS BRITONS—That the editors of *The Veterinary Journal* (London) have become interested in autotherapy is evidenced by the fact that they have reproduced in their October issue the article on that subject by Dr. D. J. Mangan, New York, published in the July number of the AMERICAN VETERINARY REVIEW, and we shall look forward to expressions on its application in veterinary practice from our English *confrères* in the near future.

TWENTY-FIFTH ANNIVERSARY CELEBRATED AT AMES—The Iowa Veterinary Medical Association will hold its twenty-fifth anniversary at Ames on November 12-13-14, 1912. The meeting will be held in the new college buildings, and a large representation of Iowa veterinarians is anticipated. Not one should be absent, whether a member of the association or not, from this reunion and silver anniversary of this powerful veterinary organization. This occasion is doubly important, because in addition to the fact that it marks a quarter of a century's work accomplished by the association, it offers to those who participate in it an opportunity of seeing the new veterinary buildings, and of realizing the importance that the State of Iowa attaches to veterinary medicine.

ORIGINAL ARTICLES.

INFECTIOUS ABORTION IN CATTLE.*

By Ward Giltner, D.V.M., East Lansing, Mich.

Abortion, or premature expulsion of the product of conception from the uterus in cattle, is a phenomenon that has been observed for many centuries. For perhaps a century it has been thought by some that the cause of abortion, in its epizootic form, is an infectious agent. This idea, of course, must have been very vague in the early days before the relationship of bacteria to infectious diseases was definitely established. I will not attempt to review the literature at this time, since that has been done satisfactorily by McFadyean and Stockman(1) up to 1909 and recently by Surface(2) in connection with the diagnosis of the disease. Suffice it to call attention to those researches that have a permanent place in marking progress in our knowledge of infectious abortion in cattle and its etiologic organism.

In 1896, Bang and Stribolt(3) announced the discovery of their organism, which has since been called the Bang bacillus or *Bact. abortus* (Bang). Their work was reviewed in English by Marshall (4) in 1899, but aside from this brief review little attention appears to have been paid to this vastly important work. Ten years after the publication of Bang's work, he reannounces his discoveries.(5) In 1902, Preisz(6) confirmed the findings of Bang both as regards the organism and its peculiar behavior toward intolerance of oxygen pressure. In 1908, Nowak(7) describes a method of cultivating the Bang organism in jars in the presence of cultures of *B. subtilis*, the purpose of the latter being to reduce the oxygen pressure. McFadyean and Stockman(1) reported in 1909 for the British Board of Agriculture

* Presented as a part of the report of the committee on diseases to the forty-ninth annual meeting of the A. V. M. A., Indianapolis, August, 1912.
From Laboratory of Bacteriology, Hygiene and Pathology—Mich. Agr. College.

and Fisheries on this disease. They were able to find *Bact. abortus* (Bang) as the etiologic factor in infectious abortion in great Britain. To them also must be given the credit for suggesting much of the diagnostic and immunization work that has followed, such as the complement fixation test, agglutination reaction and the use of "Abortin."

Zwick(8) in 1910 was able to establish the identity of the disease in different European countries by a comparative study of the Bang organism.

MacNeal and Kerr(9) in 1910 published the first account of the isolation of this organism in America. They suggested the name *Bacillus* (or *Bacterium*) *abortus*. We would use the latter generic name in accordance with Migula's classification. We have studied MacNeal's culture and have compared it with the organism isolated by us in May, 1911, at the Michigan Agricultural College. We believe our organism is the Bang bacillus. We announced the finding of *Bact. abortus* in the Report of the Bacteriologist(10) for 1911, and in the 1911 report of the United States Live Stock Sanitary Association.(11) In this same report we find the work of Good(12), which also establishes the existence of *Bact. abortus* in Kentucky. There is also in this report an announcement of the application of the complement fixation test in the diagnosis of abortion by Larson(13) and independently by Hadley,(14) although this work seems to have been done in co-operation. Russell(15) calls attention to this work in October, 1911. Wall,(16) however, in Denmark, and probably without knowledge of McFadyean and Stockman's work, had already in 1910 announced the value of the agglutination and complement fixation tests in abortion diagnosis. In this same year, Holth,(17) also, calls attention to the application of the complement fixation test as a valuable diagnostic measure. During the present year, Larson(18) has given us another paper corroborating previous findings concerning the complement fixation test as a method of diagnosis. We wish to call attention to his error in attributing to McFadyean and Stockman the Nowak method of cultivating *Bact. abortus* in sealed jars in the presence

of *B. subtilis*. It would seem proper to give McFadyean and Stockman credit for first suggesting the complement fixation and agglutination methods as diagnostic methods. There have also been published this year a bulletin by Hadley and Beach(19) along the line of the work previously announced by the former and by Larson, and an exceptionally well executed piece of work by Surface(2) on the complement fixation and agglutination tests. Attention should certainly be directed toward the circular(20) of the Bureau of Animal Industry, which announces the finding by Schroeder and Cotton(21) of an organism in milk that produces lesions in guinea pigs resembling tubercles, followed by the demonstration by Mohler(22) and Traum that this organism is the abortion bacillus. Smith and Fabyan(23) focus attention on this feature in a very interesting article on the lesions produced in guinea pigs by *Bact. abortus*.

One cannot avoid the conclusion that progress is being made in the solution of the problems connected with infectious abortion. The literature has emphasized the causal organism and the serum tests for diagnosis. Little progress has been noted in the matter of immunization and handling of the affected animal. We wish to call your attention to the great importance of the handling of the cow that has developed that conspicuous "symptom" of the infection; we refer to the act of abortion itself, which must be looked upon as only an incident in the course of the disease and not a necessary or constant feature. Our experience indicates that retention of the placenta is a very frequent sequel of abortion after the seventh month of pregnancy. Manual removal of the membranes is a procedure usually attended with difficulties and followed by a more or less severe purulent metritis. It can be stated with a degree of positiveness that disinfection of a mucous membrane, especially a parturient uterine membrane or one observed after an infectious abortion, is an impossible task. Auto-purification may, usually does, take place after weeks or months. The efforts of the veterinarian should be directed toward assisting nature, not in placing greater burdens upon an already seriously affected tissue. Only the mildest anti-

septic solutions can be used on the genital mucosæ without producing untoward symptoms, as has been pointed out by Williams.(24) In the report of the bacteriologist of the Michigan Agricultural Experiment Station for 1910,(25) we reported on our success with a method designed to take the place of chemical or coal-tar disinfectants in this connection. During three years we have used this method and are firm in our faith in its efficacy. Briefly, the procedure consists in preparing sour whey by inoculating fresh separator milk with a pure culture of *Bact. bulgaricum,* and after firm curd has formed, straining through sterile cheesecloth. The whey thus secured has an acidity of about one per cent. It is injected into the uterus in quantities of about four ounces while the cervix is relaxed; after the closure of the os it is introduced far forward into the vagina. A sterile rubber tube and funnel is well adapted for this purpose. The injections may be made daily or at such intervals as the state of the case appears to demand. We have treated a large number of animals in this manner and have in no case failed to bring the arrival in a short time to an apparently normal condition. It is not unknown to find animals pass to a fatal issue as a result of the more drastic methods of vaginal injections of disinfectants, and sterility not infrequently results from such non-fatal procedures. Our treatment can be recommended as absolutely safe, efficient and not attended by unfavorable sequelae.

The diagnosis of abortion may be discussed under the following headings: (1) Clinical diagnosis; (2) complement fixation test; (3) agglutination reaction; (4) the use of "Abortin." As for the determination of the true character of the affection by clinical methods, we are unwilling to give any encouragement. Clinical methods have great value, but are far too indefinite, intangible and in too many actual cases absolutely unreliable. One should carefully read the description of cases by Bang and by McFadyean and Stockman(1) to understand the clinical pathology of the disease. That the complement fixation test is of great value in the diagnosis of infectious abortion there can be no doubt. The recent work of Surface(2) demonstrates this

point beyond the shadow of doubt. He introduces many changes in the technic of great value. To say that this test is infallible is going too far. So many factors enter into the actual technic that error is not easily avoided. The test is weakened by its very complicated nature, and that it will become the universal method of determining the infection cannot be prophesied. Our experience in this connection does not encourage us in believing that it will. The use of the agglutination test, like the preceding, is an adaptation of a well-known phenomenon to a new but analogous case. In favor of this test is its comparative simplicity. While it will always be a laboratory procedure, the factors involved are fewer and more easily controlled. Its interpretation requires none the less expert observation. McFadyean and Stockman(26) this year give encouraging report concerning the agglutination test. They state that one will be justified in regarding complete agglutination with a serum dilution of 1-50 or 1-100 as strong evidence of infection. The blood serum of animals affected with contagious abortion may agglutinate abortion bacilli in dilutions of 1-800. As a rule, normal serum agglutinates at a dilution of not more than 1-10. Brüll(27) states that sound animals furnish a serum agglutinating at 1-32, while habitual aborters furnish serum agglutinating at 1-120 up to 1-1,600. The work of Surface tends to substantiate these statements, but he believes that only agglutinations at a dilution of 1-100 and above show positive evidence of infection. Those agglutinating at dilutions between 1-20 and 1-100 may or may not be infected. Surface believes the complement fixation test to be the most reliable method and suggests checking up this test against the agglutination reaction and regarding only those that react to both tests as infected. Another important defect in these tests consists in their inability (as we understand them now) to differentiate between infection and immunity produced by the Bang bacillus. A pregnant cow may be infected and react and she may or may not abort. It is possible that a pregnant cow may react without being infected on account of the effect of a previous infection. A non-pregnant cow may react either on

account of a present or previous infection. In brief, the conditions are so peculiar in this disease that a reaction leaves us in a most unsatisfactory and conflicting state of mind concerning its significance. Our work with these tests adds little to what we have reviewed above, and confirms our opinion based on a critical review of the literature.

Regarding the last-mentioned test, we believe that something of great interest presents itself. McFadyean and Stockman(1) first made the material called "Abortin" in much the same manner as tuberculin and mallein are made. They used a dose of about 10 c.c. and introduced it intravenously or subcutaneously. Alarming symptoms (possibly anaphylactic) followed its use by the former method in some cases, consequently prohibiting its use in this manner. By the subcutaneous method, a temperature reaction similar to that secured in the tuberculin reaction ensued in from two to six hours after the injection. The results are not clear cut in that all infected animals give a typical temperature reaction with all non-infected animals showing no temperature variation, but it certainly does give a reaction in many cases. Brüll,(27) after continuing his work with this reagent, reports unfavorably on its use. In the report of the Bacteriologist for this year, we present the results of this test on thirty-three animals including a number of retests.

The "Abortin" which we used was made by growing *Bact. abortus,* isolated by ourselves and by MacNeal, in naturally sterile horse serum, 10 c.c. + glycerinated bouillon 60 c.c. for 49 days at 37° C. Cloudiness was considerable and sediment abundant. The cultures, heated for thirty minutes in steam and filtered several times through filter paper, consequently contained many dead organisms. The material was preserved in .5 per cent. phenol by addition of one part to nine of 5 per cent. solution of phenol. It is not at all improbable that a more powerful reagent can be made capable of giving better results. We have grouped our animals under five headings: (1) No reaction, no abortion; (2) reaction, no abortion; (3) aborted, no reaction; (4) aborted, reacted; (5) not pregnant, not reacting. Unfortunately, we were unable

to check up our results by one or both of the serum tests. This is the line of work that should be pursued. The real value of all three tests may be determined in this way. No comment is necessary concerning our first group. They did not react and there is no clinical reason why they should have reacted. As for the second group (that reacted) we are under the necessity of explaining why they did not abort. It is as easy to explain it in this connection as it would be in connection with the serum tests where the same things happen. Abortion is a symptom of the disease—it may be present or absent. In these cases it was absent. Let us call attention to the possibility of an immunizing effect due to the injection of "Abortin," which may explain why our reactors did not abort. This is quite logical, and if the suggestion has any weight, we have here an opening to a valuable field of bacterial therapeutics. Our next group shows those that aborted, yet gave no reaction. This should not happen if we expect the test to be valuable. We may here again explain away the weakness of the test. Three of these animals failed to react, although they had aborted and had reacted to a previous test made at a time nearer to the act of abortion. Possibly their failure to react to a second test is attributable to the effects of the previous injection of the reagent. This is the case in tuberculin testing many times. In another animal the test was made over a month after the abortion occurred. Possibly the effects of the infection did not remain long after the act of abortion, thus leaving the animal not in a condition (of anaphylaxis?) to respond to the reagent. For the remaining animal, no suggestion can be offered as to why there was no reaction. However, it is well to bear in mind that in a herd affected with infectious abortion, accidental abortions may take place. Concerning the fourth group (reactors that aborted) little need be said. These animals responded to the test as one would expect. Still, we are not satisfied with the degree of thermal reaction in all cases. Nothing need be said concerning the last group. In comparison with the work done by others on the serum tests, our results are not so disappointing. So far as our present knowledge is concerned,

we are willing to admit that the "Abortin" test as a reliable diagnostic agent in infectious abortion has narrow limitations. In favor of the "Abortin" test is the possibility of its easy application by the practicing veterinarian who has no laboratory facilities or who has no special training in serum diagnosis. In order to make future serum tests of wide applicability, it would be well for veterinarians to learn to draw samples of blood from bovines. We have taken samples from the jugular, from the milk vein and from the ear veins.

We wish, finally, to consider in a brief manner the possibilities of bacterial immunization in this disease. Nothing is more remarkable in science than the fact that Ehrlich stands out as the leader in thought along two apparently unrelated lines of immunology and therapy in infectious diseases, viz., by anti-bacterial agencies having the specific organism of the disease as their basis and by chemical therapeutics related to the specific cause of the disease only in their apparently selective antagonistic action. Is there any hope of preventing or overcoming the infection by *Bact. abortus* by means of chemical agents? A well-known and highly recommended remedy widely advertised in the agricultural press has been found upon independent analyses by the United States Department of Agriculture(28) and the Michigan Agricultural Experiment Station chemist to be composed of "approximately 98 per cent. of water, the remainder consisting of phenols (carbolic acid), oil of cloves, and a very small proportion of what appeared to be some form of vegetable matter." One is not entitled to condemn *a priori* the use of phenol in combating infectious abortion. There has been a feeling in the popular mind and among many veterinarians both in Europe and America that phenol injected subcutaneously or introduced with the feed has power to prevent an infected animal from aborting. For a long time we recommended the use of and used personally on two large herds two per cent. phenol in subcutaneous injections and as large doses of 5 per cent. phenol in the feed as we felt it would be safe to use.(29) There have been times when we were encouraged in the belief that this method was effective. But re-

peated failures when the conditions for the experiment were ideal have forced us to abandon hope of success from this line of treatment.

Nuesch(29) claims to have checked the disease by internal administration of 1¾ to 2⅝ pints of one per cent. aqueous solution of phenol daily in single dose. He treated both pregnant cows and those which had already aborted daily for from five to ten days, and observed no unfavorable results. McFadyean and Stockman(1) place no confidence in the efficacy of this drug.

Bang(5) and McFadyean and Stockman(1) have opened up the field of bacterial therapeutics and immunity production in infectious abortion. Mohler(22) reports attempts along this line. One of the prominent biological manufacturing houses in this country is or has been engaged in exploiting this idea perhaps prematurely. Piorkowski(30) did not succeed in procuring a serum but made a soluble toxine as an opsonic precursor from the bacilli by means of catalytic procedure. Veterinarians used it with good results. Hesse,(31) using a bacterial extract, reports that in one case the dose of 20 c.c. was apparently too large, for the animals showed tympanites, but recovered in three days. No more abortions. In another case, 10 c.c. was injected first at the end of the second month of pregnancy, again at the fourth and lastly at the sixth month of pregnancy. No more abortions occurred.

We are now working upon the hypothesis that infectious abortion is a local uterine infection, so far as the cow is concerned, and that immunity will be phagocytic as in many other local infections. Theoretically, phagocytosis will be stimulated by raising the opsonic index, and this should be accomplished by the injection of living or dead abortion bacteria. We attempted to immunize a virgin heifer with living cultures of the abortion bacteria. The injection subcutem of 65 c.c. of culture produced a thermal reaction beginning on the following day and lasting about three days. The agglutinative power of the heifer's blood increased within one week from 1-10 to 1-250 as a result of the injection. A second similar injection after one week of 130 c.c.

of culture produced a rise of temperature up to 105° and lasting for some time. This heifer, together with another untreated heifer, was bred twelve days after the last inoculation. After about four and one-half months of pregnancy, both heifers were injected intravenously with 10 c.c. each of a typical culture of *Bact. abortus* incubated five days. Only a slight temperature reaction followed in each case. No other effects of the inoculation were observed. Three months and eight days later, or at nearly the eighth month of pregnancy, each heifer was again inoculated with 10 c.c. of a similar culture intravenously and each received 30 c.c. of the same culture into the vagina. No temperature reaction occurred. Each animal experienced a normal parturition. In this experiment the desired result was not obtained. It is probable that the culture employed was lacking in active pathogenic properties, so that the effects of the inoculation were not apparent in either normal or treated animal. Such a culture may be highly desirable in immunity production. This is a point that it may take years to determine. Workers with tuberculosis have laid great stress on the particular strain of bacillus. Judging from descriptions of the cultures isolated by the different workers, we are led to believe that there is a great variation in cultures of the abortion germ of different origin. In concluding our discussion of immunity production, we suggest that the following may be a practicable plan: Inject all non-pregnant females subcutaneously with the living culture, once, twice, or more times, using 30 c.c., more or less, of culture. Which particular strain to use must be determined in a way yet unknown to us. Theoretically, the last injection should be made a sufficiently long time before impregnation to give assurance that the germs of abortion have been eliminated from the system. All pregnant cows should be tested with "Abortin," not so much for its diagnostic value as for its hypothetical therapeutic function. We can already foresee the difficulties arising in the employment of the serum tests when we begin our immunizing work. We assume (without proof of the facts) that all animals treated as we have indicated will react to these tests regardless

of whether a satisfactory immunity has been produced. We are assuming that these injections are harmless, the assumption being based upon the observed fact that all the animals so treated by us have shown no signs of ill health although a number of them are failing to conceive. May it not be possible that these injections will show a specific action toward the reproductive organs detrimental to their normal functions even as in natural infection we see a definite local specific action toward these organs in pregnancy?

To conclude this heterogeneous array of thoughts, we would call attention to the cultivation of the abortion germ in artificial media and laboratory animals. We have been able to produce abortion in guinea pigs and in rabbits but not in white rats and not uniformly in the two former animals. In attempting to immunize non-pregnant guinea pigs with living cultures injected subcutaneously and intraperitoneally, we have had unsatisfactory results and have observed, but not constantly, some of the phenomena pointed out by Smith (23) in this connection and by the workers in the Bureau of Animal Industry. (21)

In making a comparative test with media prepared from pregnant uterine wall, fœtal membranes, fœtus and amniotic fluid separately, we were able to use the last named only with marked success. Amniotic fluid sterilized with or without addition of agar or gelatine has proven the most successful medium yet tried. The field for experimentation in this disease is great and the workers are few, but it is gratifying to see the vigor that has been instilled into the campaign from Minnesota, Wisconsin, Kentucky, Illinois, from the federal authorities and others in this country in addition to the work abroad.

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EDUCATING THE PUBLIC ON THE "CONTROL AND ERADICATION OF TUBERCULOSIS,"*

By John F. DeVine, D.V.S., Goshen, N. Y.

I daresay some of the audience, after reading the title of my paper, are wondering what a country practitioner can have to say that would justify the time to be consumed on a subject that has been worn so threadbare as this by scientists and pretenders during the past decade.

I realize, fellow members, the persecution of sitting on hard seats on a hot day and listening to a drawn-out discourse on anatomy, physiology, pathology, molecular affinity, cell reaction, etc. I have neither the ability or desire to attempt any such imposition. One thing I promise you, and that is, that my paper will have at least the merit of brevity.

We hear much of the necessity of educating the public, if we are to succeed in suppressing tuberculosis or any other plague, and I am a little inclined to agree with those who think that this is one of the very important factors. Someone has wisely said that "The safety of a nation depends upon the intelligence of its people." We certainly may add that "The health of a nation depends upon the intelligence of its people." We are also told that "The essence of any law is the consent of the governed." It would seem, then, that in conjunction with legislation in our efforts to control tuberculosis, the question of *how* the public should be educated is of much importance.

I have heard lecturers and educators of many kinds attempt to educate the public on the subject of tuberculosis, some of which were objects of pity from their lack of knowledge of the first principles of physiology, bacteriology or pathology; others, again, that were so severely technical that they dismissed their

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audience without driving home a single principle that could be used even as a prop by those who would be willing to assist in the work.

Let us express our views and experiences on this very important phase of the question. Here are mine to start the discussion; make note of them, dissect them if you please, with a hope that a safe, sane, productive plan may evolve therefrom.

It is my opinion that the public needs to be honestly educated on the true nature and characteristics of the disease so far and no further than our knowledge of to-day carries us. That the layman should get this knowledge orderly arranged in his mind, coupled with the modes of infection and the portholes of contagion, I believe is absolutely necessary so that he may better understand the measures of suppression, the advantages and reasons of tuberculin and its limitations. This knowledge they must have if they are to become permanent supporters of our faith; without it their minds are in an oscillating condition, ready to be swayed by the gossip listened to on the cracker box at the corner store or the exaggerated reports of the wonder minds gathered at the milk station in the morning spending their valuable (?) time getting fiction out of their system, which they probably recently extracted from some farm or stock papers, the author of which is either too malicious or ignorant to write an honest and instructive article.

Those of us whose work brings us in touch with this subject should make an effort at every opportunity to make known to dairymen and breeders in a plain way that tuberculosis is due to a specific organism, that this germ and this alone causes the disease, and that if we get rid of the organism we can in turn control the disease; that fresh air, sunlight and disinfectants are the factors to be taken into account in the destruction of this organism. That tuberculosis is also a communicable disease, but it differs from many of the other ordinary specific and communicable diseases in being slow and insidious in its development, ofttimes making an early diagnosis impossible without the aid of laboratory agents. We should also point out to them the

indefinite period of incubation and making a comparison with some of the diseases they are fairly familiar with, such as scarlet fever, measles, diphtheria and the like, pointing out to them the fact that should a certain time elapse after the exposure to one of the diseases just mentioned that one could feel reasonably safe that they would not come down with the disease, but not so with tuberculosis. We should make it plain that in poorly lighted and badly ventilated stables where the germs of tuberculosis are present in great quantities there is greater danger of infection than in a building where the conditions are sanitary, and the germs fewer in number as well as probably less virulent owing to their exposure to sunlight and air. Again, an important point is to have the layman to understand that most specific diseases run a definite course, and if the affected one recovers and the disease leaves no sequel, the individual is apt to regain normal health and be as well as they were prior to their illness; some diseases even leaving a limited or permanent immunity. This is not so with tuberculosis; when infection is once established the germs do not cause illness by toxins which they secrete, as they do, for example, in diphtheria, but being parasitic in nature they live upon the tissues of the host, which they eventually destroy if their progress is not checked or arrested, as they divide and subdivide in many more. A layman should likewise understand that tuberculosis again differs from other communicable diseases in that its arresting or so-called cure is very uncertain and insecure. That tuberculosis bacteria may remain in a dormant or semi-dormant condition for an indefinite period or that the diseased parts may become healed, as it is termed—which consists in the diseased area becoming incapsulated by lime salt deposits or bands of fibrous tissues. That this arresting denotes resistance of the tissues over disease and that so long as this is maintained the disease will not make further progress; but should the system become weakened in any way and these barriers broken down, the disease may light up anew and make rapid progress, often causing death by what is termed hasty consumption. When stockmen are in possession of this knowl-

edge it will then be easy to make them understand the dangers of feeding infected milk to young calves or the exposure to infection by allowing them to mingle with animals not known to be free from tuberculosis; they will then better understand why a certain percentage of the young animals that were supposed to be healthy, react when the tuberculin test is applied at the age of ten months or a year; they will likewise understand why some of those which are infected may not react upon the first test. which is so often so in young animals that have become infected during the milk-feeding period and later healed temporarily when turned to pasture in the open and fed upon healthy fodder; they will then be able to better understand the limitations of tuberculin and when you advise them that tuberculin does not act upon the organism but rather upon the tubercular tissue and, therefore, that you would not expect a reaction during the incubative stage. They will likewise understand why tuberculin does not give a reaction on the so-called healed cases where the diseased areas are inclosed by nature's process of arresting the disease. When we have explained this and the possibility of a non-reacting animal being affected with generalized tuberculosis so that the small amount of tuberculin injected will cause no systemic disturbance, their minds are then in a condition to see why only a properly trained veterinarian is capable of making a proper and reliable tuberculin test.

The method of detecting tuberculosis in the living animal is at present receiving much attention, and it is fortunate that it is, because the more accurate and the more expert our knowledge becomes on this question, the more valuable can we make our profession in suppressing this scourge. The opinion seems to be gaining ground, particularly on foreign shores and also among a few in this country, that by frequent physical examinations a veterinarian skilled in physical diagnosis can detect a certain percentage of tuberculous animals and practically all of those that are distributing virus. The experience of some of us makes it hard to accept this doctrine. The extreme susceptibility of bovine animals to tuberculosis and the uncertainty as to when an infected

animal may give off virus, either in its milk or through any of the eliminating channels of the body, would seem to undo the possibility of so freeing an infected herd from tuberculosis or raising healthy calves on the unheated milk of such a herd. We have been told by some veterinarians, of whose ability and integrity there can be no possible question, that they have eliminated tuberculosis from infected herds without the aid of tuberculin. Personally I feel that unless they have posted every animal of such a herd or submitted them to a carefully repeated tuberculin test, that they cannot be certain that they did eliminate tuberculosis from such a herd. Let this be as it may, it is further our duty to advise the public of the merits of tuberculin in detecting tuberculosis until it is supplanted by something more satisfactory.

It is my judgment that we are justified in stating that properly prepared tuberculin, properly applied by a properly trained veterinarian, is one of the most accurate diagnostic agents known to man.

When tuberculin is used under the above conditions and tuberculin points that tuberculosis is present, it is there every time. Where tuberculin errs, is in the cases it does not detect; it is in the incubative, the healed and the generalized cases. Probably no production of man has ever come into more abuse and misuse than tuberculin unless it be whiskey. A reliable tuberculin test cannot be carried on by a layman, students or incompetent veterinarians. This custom, coupled with improperly prepared serum and the dishonest veterinarians and stockmen, together with errors following its use, where the tissue had acquired a tolerance by previous inoculation purposely or otherwise, are the things that have put tuberculin into disrepute. I have seen cases where every honest effort was made to rid herds of tuberculosis, the test being under the supervision of a man with ability, he spending his time in his office or his laboratory and an incompetent assistant injecting the tuberculin and taking temperatures. Now, gentlemen, we cannot get rid of tuberculosis this way; tuberculin testing does not consist in the mechan-

ical procedure of injecting tuberculin and taking temperatures, but to do it and do it properly and reliably it requires a certain amount of skill to make certain that the tuberculin is injected under the skin and not squirted down the side of the leg. It requires a man who can tell with reasonable certainty whether the rise in temperature is a reaction or from something else; this should be determined right then and there and not in an office or laboratory later where valuable information may be wanting; likewise the examiner should be so trained as to be able to detect such animals as are positively tubercular and give but little or possibly no rise in temperature; he should be a man that goes into his herd and stays there so that no details miss his trained eye. He should ascertain with reasonable certainty that the cattle have had no tuberculin within sixty days, and if in doubt he should fortify himself by using either the ophthalmic or the intradermal test in conjunction with a subcutaneous test; or, if unable to secure the proper tuberculin for this, he should resort to increased doses and begin taking post temperatures four or five hours after injecting, and carry them along to the twenty-fourth or twenty-eighth hour.

Some will argue that we cannot afford to do this, that we would not receive compensation enough for our time; to these I would say, then do not do it; explain to your clients the reason for your precaution and that you are doing it in their interest. If you find that they are looking for a fake test, tell them they are looking for a crook and not a veterinarian; you go home and get a good night's sleep and be ready for a big day to-morrow.

I herewith append a portion of the recommendation presented to the American Veterinary Medical Association in 1910 by the International Commission on the Control of Bovine Tuberculosis:

"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 tuberculosis 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 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 brought 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 50 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 tuberculin test shows 50 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 offspring. 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 any 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 the sound animals.

"(*c*) *Stable.* Reacting cattle should be kept in barns or stables 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 had 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 cleaned and disinfected. To accomplish this, all litter should be removed; floors, walls and ceilings carefully 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."

When our stockmen are in the possession of the knowledge we have just enumerated, they are then quite able to understand the suggestion and advantages of these rules and, taken together, they should assist materially those who are honestly interested in weeding and breeding tuberculosis out of their herds.

An Example of Atavism—The following clipping from a recent number of *The Rural New-Yorker* was illustrated by the picture referred to, which showed a handsome colt with a conformation that might well belong to a road horse, and spotted over the entire region of thighs, croup, flanks, loins and back up to the withers. The spots seeming to represent what could readily be the size of the hand in the living subject: "Mr. E. A. Jackson, of Madison County, N. Y., sends us the picture of colt Don Pedro, shown at Fig. 441. His sire is a black Percheron, weighing 1,300. The dam is a gray, Otego and Arabian, weighing 1,100, a very rapid walker and good worker. The mare has had several colts, but this is the first spotted one. He has evidently struck back through several generations on the Arabian side.

The next meeting of the California State Veterinary Medical Association will be held at San Francisco, December 11, 1912.

SOME IMPORTANT FACTORS IN THE CONTROL OF COMMUNICABLE DISEASES.*

By Veranus A. Moore, Ithaca, N. Y.

At the request of the chairman of the section on sanitary science I promised in an unguarded moment to discuss some of the underlying factors in the control of communicable diseases. Upon reflection it seemed presumptuous on my part to bring before this body a paper on such a general and well-known topic. I am aware, however, that with all our knowledge we, as guardians of the health of the live stock of the country, are too often obliged to witness the havoc of epizootic and communicable diseases that the judgment of the layman leads him to believe we should have prevented. Many of you hold official positions and others are advisers to executive officers who are not trained in the nature of diseases but nevertheless are charged with the responsibility of their control, and consequently veterinarians are largely responsible for the wise and for the foolish statutes, rules and regulations for controlling this class of maladies. This is a responsibility we are loth many times to assume, but in a profession like ours we must be prepared to respond to all calls and to accept the consequences.

It is not my purpose to dwell at length upon the well-known facts relative to epizoology, but as a basis for discussion it is necessary to mention briefly a few of the essential ones as they are now understood regarding the nature of infectious diseases. The discovery of a specific etiology for the epizootic and other infectious diseases has given to each a definite place in the organic world. They exist as do weeds; they spread after their own method or methods; they thrive where their environment is suitable; they disappear when conditions are sufficiently unfavorable. As each of these affections has its specific cause, the life history

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of this etiological factor gives all the information necessary to ascertain where in its cycle it can be most readily intercepted. This infers that we know the cause of all of these maladies. While this is not true in case of several of them the means by which their virus is disseminated is, with few exceptions, known. When approached as a biological problem, which it is, the control of infectious diseases resolves itself into the acquisition and application of certain definite knowledge concerning them. The most essential is to know the cause; the channel through which it escapes from the infected body; its fate after leaving the body of its host; and the avenues through which it gains entrance to the uninfected. This cycle, which is as old as dumb creation, was a veritable mystery until the researches of the pioneers in microbiology pointed the way to its revelation to man.

The question that is uppermost in this discussion is: Are we as a profession doing all that it is in our power to do to reduce the losses from infection? Have we learned as we should the lessons of preventive medicine and what they mean directly to the live stock interests of the country and indirectly to ourselves? The history of epizootics in this country shows that with several maladies the veterinary service has been efficient, while with others our progress has been lamentably slow.

A little study will point out that the diseases which have been controlled in a masterly way—more so I think in our country than in any other—are contagious pleuro-pneumonia of cattle and foot and mouth disease. An inquiry into the nature of these maladies shows that they are both highly infectious and that a large percentage of the animals exposed actually become infected. Again they are not indigenous and must be introduced. When that has happened our officials have taken them in hand and by the heroic measures of quarantine, slaughter and indemnity have banished them from the country.

There are, however, other diseases, such as anthrax, tuberculosis, glanders, rabies, infectious abortion, hog cholera and many more that seem to have been introduced and to have become well established and quite widely distributed within our borders.

Many, if not all, of these appeared before there was sufficient knowledge of their nature to apply methods for their prevention, much less for their eradication. These have continued to spread after their own means of dissemination, often aided by the habits of animal owners, until they stand out conspicuously as a menace to the live stock industry and in some instances to man himself. In that rôle they present themselves to the veterinary service of the country and defiantly say: "Stop us if you can."

The problem in conquering such enemies is centered in the acquisition and application of knowledge whereby their dissemination may be checked. Why, for example, have tuberculosis, glanders and rabies spread in our very midst? Is it because of lack of knowledge concerning the mode of infection, or is it due to other causes, such, for instance, as bad legislation that we could not or at least did not prevent?

It has often happened that people have looked for legislation or other official ordinances to check the spread of epizootics. Veterinarians have not infrequently made strenuous efforts to secure official aid to stop an epizootic where an early diagnosis and the application of the present knowledge of preventive medicine would have saved the loss. We may look to legislation for assistance, but as in a great conflagration a pail of water in the beginning will do more effective service than all the fire departments later on.

It cannot be denied that a thorough knowledge of the nature of epizootic diseases and of methods for making an early diagnosis are the most necessary elements in the control of such infections. Knowledge, however, is more easily discussed than acquired. There is a tendency now and always has been to overestimate the accomplishments possible with a little knowledge. Nowhere has this tendency been greater than in case of disease. The consequence has been that all too much reliance has been placed upon and often far reaching conclusions have been drawn from isolated facts which constitute mere fragments of knowledge and which in themselves are not sufficient to bring about the desired end. It is essential to know the cause

of a malady, but we have had that knowledge concerning the more serious of the common diseases of animals, such as tuberculosis and glanders, for thirty years and yet the discussion of methods for their control is as active and as controversial as heretofore. The fact that tuberculin gave a reaction in a large percentage of cases of tuberculosis was interpreted to mean that it would cause a reaction in all cases where infection existed, a conclusion long since found to be erroneous. It was long supposed, and by many is still believed, that after an animal had recovered from an infectious disease it was safe for it to mingle with others. Because of this supposition and because an infectious disease may even exist in such a light form as to escape recognition, fowls, swine, cattle and horses apparently perfectly sound have not infrequently been bought to the sorrow of the purchaser, who by so doing has suffered heavy losses from the disease unconsciously introduced. Again we have failed in formulating methods of control to discriminate between the highly infectious and rapidly developing diseases and those of a chronic nature, slow in development and widespread in their distribution. Thus a study of what has been attained, as well as the problems still before us along the line of control, suggest that as yet we see only in part.

The first and most important factor in the control of infectious diseases seems to be a knowledge of their cause and the means for making an early diagnosis. Coupled with this must be a knowledge of when, in the course of the disease, the virus is eliminated from the infected. This is not so significant with the highly infectious maladies where heroic measures are applied, but with such diseases as glanders and tuberculosis it is very important. All cattle that reacted to tuberculin were at first considered immediately dangerous, but the researches of recent years indicate that it is not until the disease process attains to a certain stage that the specific bacteria are given off and the animal becomes a menace to others. This fact is the crux of the German method for controlling tuberculosis. It may not be enough in itself, but it takes us one step nearer the goal.

The dissemination of viruses through secretions that may contain them is an important factor that has been neglected in many, if not most, localities. In this country tuberculosis has probably been disseminated through the separated milk and whey from creameries and cheese factories receiving the milk from infected dairies quite as much as by any other means. Russell, of Wisconsin, has demonstrated the efficiency of these unsterilized by-products in spreading tuberculosis. In Denmark the separated milk is pasteurized before it is returned to the farm. Other infections, such as foot and mouth disease, are transmitted through the milk. Efforts to prevent diseases of a chronic nature have placed too much emphasis upon the infected animal itself and all too little upon the control of the secretions that are widely distributed or utilized and which are often the agents for the distribution of the virus.

Recent investigations tend to the conclusion that the communicability of the more common infectious diseases with which we have to deal is restricted to individual contact or contact with recently given off secretions, excreta or discharges containing the virus. This tendency adds to the importance of a more careful study of "carriers" among the lower animals. The significance of chronic cases has long been recognized, but the importance of virus disseminators among animals that have recovered has not been sufficiently emphasized. Specific illustrations of this means of spreading the virus and starting up new outbreaks are not numerous where the proof is sufficient to verify the statement. I have in my personal experience, however, observed fowls that had suffered from "roup" or diphtheria and which seemed to be fully recovered, sold and placed in a flock of hens where roup had never been known and where within a short time nearly every fowl in the flock was suffering from an acute attack of the disease. In the last outbreak of foot and mouth disease in this country, a calf that had recovered, carried the infection to an entire herd. These facts are very suggestive and they bring very vital topics for the sanitarian and those who have to advise the buyers of animals. The teach-

ing from the interesting discoveries relative to typhoid and diphtheria "carriers" in the human species are no doubt applicable to several diseases of the lower animals.

With certain maladies, especially tuberculosis and glanders, the virus undoubtedly gains entrance with the occult cases. It is well known that infected but apparently sound cattle and horses have often gone down with the disease after being brought into a new environment and that they have spread the death dealing virus to one or more individuals. This fact is not new and methods have been suggested to prevent it by way of applying certain tests, such as tuberculin, mallein, agglutination or other specific reactions before accepting the animals. Experience, however, has shown that these tests are not always accurate because of the state of the disease at the time they are made. This causes us to look further and in our advisory capacity to suggest that animals must be brought so far as possible from sound herds and studs. Here again present knowledge does not always enable one to ascertain with absolute certainty whether or not the disease exists in any of the other animals. Because of the development of methods of precision there is a feeling that we must always be positive and that it is unprofessional to admit that we do not know. With material things this may be possible, but with living creatures, no man has yet fathomed all the mysteries regarding the subtle forces of resistance and susceptibility. The limitation of known tests compels one to look beyond them. Here the point is, Have the animals been exposed? To determine this requires a careful record of close observations and proper tests of a herd or stud. These should be so kept that the purchaser could determine from them whether or not he was justified in buying from this herd or stud. I have for several years advocated such examinations, tests and records as a means of guaranty by the owners of the animals. The chief objection that has been raised to such a procedure has been the lack of confidence in the knowledge or ability of the local veterinarian to do such work. When our practitioners become efficient in sanitary work their clients will, I am bold enough to predict, possess

signed records of their animals that will warrant a buyer in taking or rejecting any individual.

I do not wish to belittle any of the methods of precision in diagnosing occult cases, but I am strongly of the opinion that the repeated application of such tests in isolated cases is not tending to the best results. These tests when properly made at the right time on all of the animals of the herd or stable are most valuable, but the singling out of individuals at irregular times and often at short intervals and subjecting them to such an examination without considering the history or physical condition of the associated animals is not of so much assistance as many suppose. These infections are to be dealt with according to their various natures. The garden cannot be pronounced weed-free so long as it is not protected against seed-producing noxious plants that are thriving in the immediate vicinity. Likewise the individual animal that has been or is exposed cannot be pronounced free from infection. The dairy, the stud, the flock, are to be dealt with as units. It is in bringing about this condition that the veterinarian has a wonderful opportunity for service.

With certain maladies, there are at present no means of detecting infection in an individual until symptoms appear. Rabies may be cited as the best illustration of this class with which we have to deal. Objectionable as it is to a community, quarantine is the sheet anchor of protection here. Although isolation and quarantine are the most effective measures for preventing the spread of this group of diseases, many communities seriously oppose them. Veterinarians and physicians have not always assisted in this important work as much as they should. In my own state the enforcement of quarantine has often been obstructed by professional men who with sophistry seek to expound the nature of the disease and to point out how unnecessary it is to quarantine. Again grievous errors have been made by including too small a territory and in raising the quarantine too soon. The question here seems to be the education of the people in the nature of infections. There is still too much faith in the magic power of the "medicine man" and too much mystery

about the disease. The factor here is education and the veterinarian is the teacher. The warning that was sounded by the great leaders, that man's opinion is of no value unless founded on the truth of the laws of nature should ever be heeded.

There is perhaps no other phase of this subject so open to controversy as that of immunization and vaccination. These have been advocated by various authorities for nearly all if not every infectious disease. Results, however, are conflicting and with few exceptions, methods of immunization have not been perfected to the extent that warrants their recommendation as a means of control. There has been such a rapid succession of immunizing procedures that it is impossible to predict the final results. Already the use of vaccines is complicating specific diagnostic tests, but after more research and experimentation definite knowledge on these points will be recorded and the true worth of the newer methods will be determined. One often feels in connection with the multiplication of these new and highly recommended procedures the truth of the lines of Schiller, "We must have foolishness even to exhaustion before we arrive at the beautiful goal of calm wisdom." While every encouragement should be given to the development of immunization as a means of preventing infection, it would seem to be a safer procedure, with the diseases for which it is possible, to center attention on the elimination of the virus. The feeling of safety that dominates one who has placed his confidence in immunization permits relaxation in reference to infection. If the method employed is not efficient it is worse than nothing. There is no half-way position. The virus must be kept away or the animals must be immunized absolutely against it, if the desired protection is to be secured. Partial immunization or temporary resistance tends to modify not to prevent the disease.

The etiology of most infectious diseases with which we have to deal and the specific methods of making an early diagnosis are sufficiently well known to enable veterinarians to guard against the usual methods of dissemination. A great deal of excellent work is being done and never before did the outlook seem so

bright for complete mastery of these infections. The trouble lies in getting at the cases that escape or that are carriers of the virus and which start up the disease anew after it is thought that it has been eradicated. The essential factors here are the acquisition of further information concerning the period of incubation; the recognition of chronic cases; better methods for detecting arrested and occult ones and the detection and elimination of "carriers." To this must be added a greater appreciation of the definite time in the course of a disease when its virus is given off and its powers of resistance outside of the body.

When the solution of these problems has passed into common knowledge the cord of restraint will have been so tightly drawn about the viruses of these maladies that their power of destruction will be known as a historical fact only. Then the enormous losses now sustained will have been saved and the suffering of dumb creation caused by these diseases and which it is our humane purpose to prevent will have ceased.

THE PASTEURIZATION OF MILK, by S. Henry Ayers, bacteriologist, dairy division of the B. A. I., in Circular 184, is treated in a manner that must interest everyone, whether believers in the process of pasteurization or otherwise. The report is generously illustrated, showing several styles of pasteurizers, coolers, bottling apparatuses, etc.

A NEW JOURNAL, born of the old *Spirit of the Times* and the *Turf, Field and Farm*, comes to us under the name of "*The Field Illustrated—The Journal of Outdoor America*," and, when we consider its "breeding," remember the two grand old papers that are responsible for its birth, we are prepared to find the very excellent paper that has recently come to us under the name given above. It *is* the field *illustrated*, and no mistake; beautiful subjects beautifully illustrated. Captain A. H. Waddell, former editor of the *Bit and Spur*, is one of its editors, and from the impressions received from the copy we have seen, we shall probably have something more to say about this paper later on.

CANINE PRACTICE.*

By J. C. Flynn, D.V.S., Kansas City, Mo.

In preparing a paper on canine practice, I am fully aware of the fact that, to the average veterinarian, it is a subject, I am sorry to say, uninteresting. Some of our best practitioners, very able men, take quite an active interest in canine practice, and to these men I wish to offer an apology for the following remarks.

The dog, the most staunch and faithful friend of man, when sick, is indeed the most ill-treated and abused of domestic animals, and a little investigation into the cause of this treatment leads us to the doors of a great number of our profession.

When the dog gets sick the owner calls up the veterinarian and asks him to prescribe, which he does in about the following manner: "Oh, give him a good dose of castor oil and don't feed him for a couple of days." This advice is generally given without any inquiry into the symptoms exhibited by the sick dog. The owner can only infer that one of two conditions exists. The veterinarian either does not care for his dog practice or he does not know how to intelligently treat the dog.

In either case the carelessness of the doctor gives the client a very poor opinion of the real value, the proper administration of medicine. The next time the dog is sick it must undergo the same treatment, and the owner does not even call up the doctor to ask his advice. Or, on the other hand, if he be a wide-awake fellow, he resents such advice and calls in another veterinarian.

A great many times I have been told by my client that he had called in some certain doctor on a number of cases and that each time the latter's advice was, "Oh, give it a dose of castor oil." To take it for granted that the laity knows nothing of disease and medicine, and that their pet stock can be handled in a careless manner, is a grave mistake. We lower ourselves and our

* Read before the Missouri State Veterinary Medical Association, at Marshall, July, 1912.

profession in the eyes of the public when we fail to treat the dog in the same scientific manner in which he treat the other domestic animals.

I have heard a number of veterinarians say that they do not care for canine practice for two reasons: First, they are afraid of a dog; and second, because it is so hard to diagnose their ailments.

The first reason has some weight because, I suppose, we cannot altogether govern our natures, and if we are afraid, we should politely say so and not belittle our profession by telling the owner to give some little simple remedy like castor oil, sulphur and milk, or lard.

If you are afraid of a dog you had better let it alone, for the dog knows it better than you do and will bite you. In my experience I have never been bitten by a savage dog. I have been bitten a number of times but always by a dog that was afraid of me and not one of which I was afraid. In answer to the second reason, I will say, "Give the dog the same careful study and attention that you give the horse, and his ailments will be no harder to diagnose."

The veterinarian is not alone to blame for the lack of proper care of the sick dog. Our schools and colleges have failed to grasp the true situation and have not impressed upon the minds of the student body the necessity of a thorough training in canine practice. A proper training in canine practice cannot be secured in the limited time given to it by the schools to-day, and the graduate goes forth into the field hoping no one will ever bring a dog to him to treat. The reason we do not like a subject is because we do not understand it. If all the papers read here were in French, we would leave here thinking it a very dull meeting. In this day and age, when canine breeding has reached a condition which we may well call an art, it behooves us as veterinarians to give this important branch of veterinary science a close study, and in order that we may better serve the laity, I will present a few of the simple things with which we should all be familiar.

The first thing which should be impressed upon the dog owner is, that it costs no more to keep a good dog than a poor one, and it is a source of a great deal more satisfaction. We should also impress upon his mind that the dog is entitled to his care and protection and should not be allowed to suffer unnecessarily because in dollars and cents he is not as valuable as the horse or cow. The dog, like the horse and cow, has no one but its master to look to in time of affliction, and unlike the former, he usually looks in vain.

"The dog is his own doctor" is a phrase you hear every day, and a number of our profession agree to it. The dog is his own doctor, it is true in a measure, because conditions have made him such. He is not so by his own choice any more than you or I. He responds to and appreciates medical attention, and will only take care of his wounds when neglected by his master and forced to do so.

Prophylaxis should be the aim of every veterinarian. You can be of far greater value to your client by preventing a disease than you can by curing one. A good bed, a clean kennel, healthful food, plenty of pure water, air and sunshine will do more to keep dogs in a healthy condition than will the medicine case. Puppies should be kept free from worms and should be immunized as early as possible against distemper. I have immunized several litters of puppies as early as the fourteenth day and have found it to be quite successful and satisfactory. I find that most cases of sickness among dogs are due to the carelessness of the owner in not keeping a clean kennel, and observing the general rules of health.

The stray dog is the greatest evil to the dog man, for while in himself he is immune to most canine ailments, yet he carries and distributes more disease than any other animal, and the American Rescue League are doing a great work in finding suitable homes for the poor, unfortunate stray dogs, in the humane destruction of them. Through their efforts, the number of disease spreaders is being annually diminished in the large cities and we should always lend them a helping hand.

The veterinarian should instruct his client in the care and handling of his dogs. It is our duty not to merely look after the sick ones, but to prevent them, in so far as good advice goes, from getting sick. To do this, it is wise to advise the owner of a matron which is about to whelp, to begin at least two weeks before date of whelping, by giving her a thorough purging and to see that she is free from intestinal parasites. This can be accomplished by the administration of santonin, 1 to 6 grains according to the size of the dog, or areca nut, 2 grains for each pound weight. If purgation does not follow in a few hours after the administration of areca nut, then is the time for a dose of castor oil.

When puppies are born, they should be handled as little as possible. Over interest on the part of the owner to see which are males and which are females, or to find out the good points, is injurious to the pup and annoying to the matron.

At the age of ten or twelve days, give the puppies about one-quarter grain of santonin, to be repeated every third day until three treatments are given. This keeps them clear of the round worm (*Ascaris marginata*), which is about the only worm to fear in puppies of that age.

At the age of fourteen days they should be immunized against distemper. In immunizing puppies of this age, I use about one-quarter of the dose to be given a ten or twelve-months-old pup. By immunizing against distemper and giving treatment for worms every five or six weeks, keeping the puppies away from chance infection from the stray dog and giving them good, clean quarters, about 90 per cent. of puppy troubles is done away with. I realize that the time to which I am entitled will not allow of a lengthy discussion of the pathology and treatment of the diseases of the dog, so will confine myself to the mentioning of one or two of what I consider the most important.

Canine distemper, being the disease that causes the greatest loss to the dog raiser and most anxiety to the doctor, I will take it up in a meagre way and endeavor to give you the important points in the symptoms and treatment of this disease.

The incubation period of distemper is from five to ten days, following which time there is a period of from four to seven days in which the dog is dull and depressed; has little or no appetite; the eyes are moist and there is a thin, watery discharge from them and also from the nose; the mucous membrane of the eyes is red and the dog sniffles and sneezes and has a dry cough. The bowels are sometimes loose and the feces are mixed with blood and mucus and have a very foul odor. In some cases the bowels are not affected and we have no vomiting and purging. The temperature ranges from 102.5° to 105.5° F. The pulse runs 120 to 150, respiration 30 to 40.

The animal begins to chill early in the disease and continues to do so almost throughout its entire course. I find that there is no line of symptoms that will hold good in every case on account of the great variety of dogs one contacts and the greater resisting power of some dogs than that of others. The course of the disease is from twenty-one to forty or fifty days. There is no cure for distemper and the best we can do is to treat the animal by taking care of the pathological changes which occur.

If the bowels are loose, they should not be allowed to continue so until the dog is too weak to respond to treatment, but he should be put on a diet of boiled milk, in which some bismuth subnitrate, about 15 grains to a dose, should be given. If vomiting takes place, use malt extract with pepsin and pancreatin, about 1 tablespoonful in half a pint of boiled milk. Iron, quinine, strychnine, arsenic and nuclein as prepared by the Abbott Alkaloidal Company are beneficial in all stages of the disease.

The dog should be kept in a dry, warm place with plenty of air and sunshine. Under no consideration should a bath be given. If the dog refuses food and force feeding is necessary, raw egg beaten up in a pint of sweet milk with a tablespoonful of port wine or brandy is very nourishing. This can be given per rectum in cases where you want to keep up the strength until you can check the vomiting. Some breeds are harder to nurse through distemper than others. The pointers, setters and Scotch collies seem to have less resisting power than the bulldogs, fox terriers and airdales. If the case be taken in hand in the first

stages and carefully attended, the death rate is small, but most of the cases brought to our notice are well advanced, and we have a difficult time in saving them.

Another important disease with which we come in contact and of which the public is in constant dread, is rabies. This disease is the least understood by the laity. The true symptoms of rabies do not even excite a curiosity in the mind of the owner. If the dog suffers a heat stroke, however, or some form of epilepsy, the first thought is mad dog, and the faithful animal meets an untimely death at the hands of his excited master. It seems that the general public will never learn that the dog never develops rabies suddenly but exhibits certain symptoms that warn one of the approach of the disease several days before he becomes violent.

The various ideas entertained by the laity relative to rabies would fill a book. Some of the most prevalent ones, and the ones which we should teach our clients to dismiss, are: That the dog goes mad only in dog days; that after watching a dog which has been bitten by a rabid dog for nine days there is no further danger of rabies in the case; that the dog goes mad from pain, lack of food and water, or from an injury; that the mad-stone cures rabies; that the dog is afraid of water and cannot cross a stream; that he always runs in a straight line and that he will not go out of his path to bite anyone. Tell him in big, plain words that the dog may go mad at one time of the year as well as another if he has been bitten by a rabid animal; that he may go mad in eighteen days to eighteen months after he is bitten; that he develops rabies only from the bite of a rabid animal; that the mad-stone is a fairy story and the only cases it ever cured were cases in which the dog doing the biting was not rabid, or, the dog being mad, the person bitten was not infected by the bite; that the rabid dog can cross a stream of water and go as far as he likes from a straight line to bite someone; that a dog generally goes mad in from twenty-one to thirty days after being bitten; and that the general symptoms are a changed disposition; the animal likes to lick or gnaw some object; his eyes have a dull look; he is nervous and irritable. If he plays, it is

with a vigor akin to savageness; he takes particular notice of strangers and to any object which moves; his bark is not clear but has a peculiar rattle; he refuses food and water; his mouth remains slightly open and the saliva hangs in strings from his jaws. Later on he tries to eat and drink and will lap water for hours at a time. The inexperienced will think he is swallowing it, but he is not, for the throat is paralyzed. He later becomes weak in his hindquarters and finally falls from exhaustion for death to end his sufferings. In some cases the symptoms vary widely from the above, but these are the common symptoms seen in most cases.

Now that I have taken up a great deal of your time on the subject in which you are not so deeply interested as you are in some of the subjects already presented and to be presented, I will close by again appealing to you to give the faithful dog the attention he deserves. Senator Vest paid a high tribute to the dog when he said: "The best friend a man has in the world may turn against him and become his enemy. His son or daughter that he has reared with loving care may prove ungrateful. Those who are nearest and dearest to us, those whom we trust with our happiness and our good name, may become traitors to their faith. The money that a man has he may lose. It flies away from him, perhaps when he needs it most. A man's reputation may be sacrified in a moment of ill-considered action. The people who are prone to fall on their knees to do us honor when success is with us, may be the first to throw the stone of malice when failure settles its cloud upon our heads.

"The one absolutely unselfish friend that a man can have in this selfish world, the one that never deserts him, the one that never proves ungrateful or treacherous, is his dog. A man's dog stands by him in prosperity and in poverty, in health and in sickness. He will sleep on the cold ground, where the wintry winds blow and the snow drives fiercely, if only he may be near his master's side. He will kiss the hand that has no food to offer; he will lick the wounds and sores that come in encounter with the roughness of the world. He guards the sleep of his pauper master as if he were a prince. When all other friends

desert he remains. When riches take wings, and reputation falls to pieces, he is as constant in his love as the sun in its journeys through the heavens.

"If fortune drives the master forth an outcast in the world, friendless and homeless, the faithful dog asks no higher privilege than that of accompanying him, to guard him against danger, to fight against his enemies. And when the last scene of all comes, and death takes his master in its embrace, and his body is laid away in the cold ground, no matter if all other friends pursue their way, there by the graveside will the noble dog be found, his head between his paws, his eyes sad, but open in alert watchfulness, faithful and true even in death."

Holding Up a Circus—Surely the world moves. A humane officer in Akron, Ohio, held up a circus parade in the streets, took a horse out of the procession, and sent it to a veterinarian for treatment. When the lame horse was finally removed the circus people were allowed to continue their march. That's the sort of stuff needed in a first-class humane agent.—(*Our Dumb Animals.*)

Good Breeding Pays—The following clipping from the *Breeders' Gazette* of October 16 demonstrates what careful breeding can accomplish: "To the Gazette—History was made at George Taylor's sale of milking short-horns, as every one expected it would be. Twenty-five of the cows sold at the Cranford dispersal had attained the 1,000 gallon standard. The most sensational bidding was for the seven-year-old cow Waterloo Baroness, which Sir Gilbert Greenall secured for $2,625, the highest price ever paid for a dairy short-horn in Britain. Sir Gilbert bought ten cows all told for his new herd in Ireland. The Oxford, Darlington, Wild Eyes and Waterloo strains were in most demand. The other chief purchasers were: The Duke of Devonshire, $1,317 for Darlington Cranford 24th; J. & H. Robinson, $1,056 for Furbelow Princess 2d; the Rev. C. L. Brocklebank, $1,050 for Furbelow Baroness; Samuel Sanday, $1,260 for Wild Eyebright 35th; J. & H. Robinson, $1,338 for Barrington Duchess 55th; J. Ellis Totter, $1,575 for Darlington Cranford 49th; Viscount Tredegar, $1,050 for Oxford Belle 5th.

"All told 187 head were sold for $77,478, or a little more than $413 apiece."

THE NORMAL CLINICAL URINALYSIS OF THE DAIRY COW.*

By Daniel J. Healy, M.D., Bacteriologist, Kentucky Agricultural Experiment Station, Lexington, Ky.

During the study of a certain pathological condition occurring among dairy cows, it became necessary to determine what might be considered a normal clinical urinalysis. The problem, which presented itself, was not to determine a complete urinalysis, but one which could be used as a clinical standard, any marked deviation from which would indicate an abnormal condition of the function of the kidneys.

The difficulties which are met with when an attempt is made to collect the urine for the entire twenty-four hours, and the bacteriological and chemical changes which occur in a specimen during this period, make it very undesirable to use the twenty-four specimens for clinical purposes.

The specimens used in the present work were obtained, once during the twenty-four hours, from the registered Jersey cows which form the Experiment Station dairy herd. The specimens, with the exception of four, were obtained during the period of evening milking, between the hours of four and six o'clock. At first, an effort was made to obtain the urine by means of a catheter; but this was found impracticable, as the difficulty of using the instrument, the risk of infecting the bladder, and the general disturbance created among the cows at milking time, more than counterbalanced the advantage of increased rapidity with which the specimens could be obtained. The method finally used was that of waiting, with a one-litre saucepan, until a cow urinated, and then catching the urine in the saucepan. As a rule a cow will pass several litres of urine at one time, and it was the practice to allow the first portion of urine to escape, and then catch

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From the Laboratory of the Kentucky Agricultural Experiment Station, Lexington, Ky.

what followed. The average cow will urinate once every hour or hour and a half, and with a herd of thirty-two cows there was very little delay in obtaining a sufficient number of specimens each day.

A clean, 125 c.c. glass-stoppered, wide-mouthed bottle was filled with each specimen, the date, time and name of cow noted on the label. The bottles were then returned to the laboratory where they were immediately placed in the ice chest at a temperature of 4 degrees C., where they remained until the following morning, at which time the analysis was made. The analysis was divided into three parts, the clinical, the chemical and the microscopical.

THE CLINICAL DATA—The clinical data included the date, the name and age of the cow, whether or not she was pregnant, and if so, the period of pregnancy, the number of pregnancies, the time since last calving, and the feed.

THE CHEMICAL DATA—The chemical data included the color, the clarity or otherwise, and the precipitate. These points were observed while the urine stood in an ordinary urinometer glass. The specific gravity was observed with an urinometer. The reaction was tested with litmus paper. The urea was estimated according to Hufner's method, the principle of which is that urea is decomposed by an alkaline solution of a hypobromite, with the evolution of nitrogen gas, which may be collected and measured, while the carbon dioxide given off, at the same time, is absorbed by the sodium hydrate solution.

The solution used was prepared in the following manner: 108 grams of caustic soda were dissolved in 250 c.c. of water, and the solution allowed to cool, and 25 c.c. of bromine were then slowly added. If the solution is tightly stoppered and kept in the ice chest it will remain good for several months.

The apparatus used was that known as the Doremus urinometer, the sample being allowed to stand for one hour at room temperature, and the volume of gas corrected to a standard temperature.

To check the correctness of this method the following experi-

ments were made: Seven ureometers were filled with the hypobromite solution, then to No. 1, 1 c.c. of urine was added; to No. 2, 1 c.c. of the same urine to which 0.1 per cent. of urea had been added; to No. 3, 1 c.c. of urine to which 0.5 per cent. of urea had been added, and so forth. The following table gives the results:

1. One c.c. urine, no added urea, = 0.321% urea.
2. One c.c. urine + 0.1% urea = 0.396% urea.
3. One c.c. urine + 0.5% urea = 0.910% urea.
4. One c.c. urine + 1.0% urea = 1.435% urea.
5. One c.c. urine + 1.5% urea = 1.930% urea.
6. One c.c. urine + 2.0% urea = 2.475% urea.
7. One c.c. urine + 3.0% urea = 3.514% urea.

The average error of the above seven determinations is an increase of 0.1% above the actual urea added.

The ammonia was estimated according to a method kindly furnished by Dr. J. H. Kastle, of this station. The principle of this method is that free ammonia reacts with formic aldehyde to form hexamethyltetramin, thus:

$$4NH_3 + 6H_2CO = N_4(CH_2)_6 + 6H_2O.$$

Free ammonia does not occur in the fresh urine, but exists in the form of salts. If the urine is previously made neutral and then tenth-normal caustic soda added in the presence of formalin, free ammonia is formed and reacts as fast as formed with the formalin. The titration is done in the presence of neutral potassium oxalate, which prevents the obscuring effect of ammonia on the sharpness of the end point with phenolphthalein. The following solutions are required:

1. A tenth-normal sodium hydroxide.
2. Commercial formalin, diluted one-half with water, and made neutral with sodium hydroxide, using phenolphthalein as an indicator.

The technique is as follows: About 60 c.c. of urine are treated with 3 grams of dry basic lead acetate, well stirred and filtered. The filtrate is treated with 2 grams of dry neutral potassium oxalate, and filtered, using a dry folded filter. Ten c.c. of

the clean filtrate are then diluted with about 40 c.c. of distilled water, and 20 grams of dry neutral potassium oxalate and a few drops of phenolphthalein solution added. The mixture is either slightly alkaline or acid. If alkaline, a drop of dilute sulphuric acid is added, and then it is neutralized with tenth-normal sodium hydroxide. If acid, it is also neutralized. Twenty c.c. of the neutral formalin solution are then added, well stirred, and the solution again titrated with tenth-normal sodium hydroxide to neutralization. The reading of the second titration represents the number of cubic centimeters of tenth-normal ammonia in 10 c.c. of urine.

To check the correctness of the above method the following experiments were made:

A sample of urine tested 0.0042% ammonia. Then to four portions of this urine of 10 c.c. each, sufficient ammonium chloride was added, so that the total ammonia would be increased 0.001% : 0.01% : 0.1%, and 1.0%. The following table gives the results:

10 c.c. of urine, no NH_4 Chloride tested 0.0042% NH_3.
10 c.c. of urine + 0.0003 gram NH_4Cl. tested 0.0053% NH_3.
10 c.c. of urine + 0.0033 gram NH_4Cl. tested 0.0134% NH_3.
10 c.c. of urine + 0.0332 gram NH_4Cl. tested 0.1014% NH_3.
10 c.c. of urine + 0.3324 gram NH_4Cl. tested 0.9965% NH_3.

The average error was a loss of 0.0053%.

The estimation of the hippuric acid presented difficulties which at first seemed impossible to overcome. However, as the methods used for estimating both the urea and ammonia proved fairly accurate, and as these, together with the hippuric acid, would represent the total nitrogen content of the urine, the following method for estimating the hippuric acid was used: The urea and ammonia were first determined according to the above methods, and then by multiplying the per cent. of urea by the factor 0.4666, the per cent. of urea nitrogen was determined, and by multiplying the per cent. of ammonia by the factor 0.8235, the per cent. of ammonia nitrogen was determined. Next the per cent. of total nitrogen was determined by the Kjeldahl method

as follows: Ten c.c. of urine was placed in a Kjeldahl flask, and 10 grams of powdered sodium sulphate and 20 c.c. of concentrated sulphuric acid added. The contents of the flask were then digested over a free flame for two and a half hours, or until all color had disappeared. After cooling 200 c.c. of tap water were added and sufficient saturated caustic soda solution to make slightly alkaline, a small quantity of powdered zinc to prevent lumping, and the ammonia distilled into a known quantity of sulphuric acid, after which the sulphuric acid solution was titrated with a tenth-normal caustic soda solution, using cochineal as an indicator. The urea and ammonia nitrogen were subtracted from the total nitrogen and the difference calculated as hippuric acid. To check the correctness of this method the following experiments were made: Ten c.c. of human urine was tested with the following results:

Two samples, calculated urea nitrogen.....	1.1816%
Two samples, calculated ammonia nitrogen.....	0.1077%
Calculated total nitrogen.....	1.2893%
Actual total nitrogen, Kjeldahl method.....	1.2471%

Then eight samples of 10 c.c. of the same urine were taken in duplicate of two and two. To the first set 0.01 gram of hippuric acid was added, this being equal to 0.1%. To the second set, 0.05 gram of hippuric acid was added, this being equal to 0.5%, and so forth. The following table gives the results:

3. 4.	0.1% added hippuric acid.	
	Total nitrogen, Kjeldahl method....	1.2570%
	Hippuric acid calculated.....	0.1265%
5. 6.	0.5% added hippuric acid.	
	Total nitrogen, Kjeldahl method....	1.2860%
	Hippuric acid calculated.....	0.4974%
7. 8.	1.0% added hippuric acid.	

Total nitrogen, Kjeldahl method....	1.3200%
Hippuric acid calculated.....	0.9321%

9. }
10. } 3.0% added hippuric acid.

Total nitrogen, Kjeldahl method....	1.4680%
Hippuric acid calculated.....	2.8296%

The above table shows this method is fairly accurate in estimating the hippuric acid, the experimental error being greater than is shown by this table, for the error in reading the urea percentage will average 0.1344%, which would amount to 0.0626% nitrogen, which calculated as hippuric acid would equal 0.3004%.

The presence or absence of sugar was determined by Fehling's copper sulphate method.

The presence or absence of albumen was determined by heating to boiling the upper portion of about 10 c.c. of clear urine contained in a test tube, and then adding, drop by drop, a dilute, one-tenth solution of acetic acid, the production of a cloudiness being considered a positive test for albumen.

MICROSCOPICAL DATA—Fifteen c.c. of the urine were precipitated in the electric centrifuge, running at 600 revolutions per minute for 10 minutes. The precipitate was then placed on a microscope slide, a cover-glass placed over it, and examined with a magnification of 140 diameters.

Analyses were made of 100 samples, collected from twenty-nine cows, during a period of six months. The months and the number of samples examined in each month were as follows:

January: 20 samples.
February: 9 samples.
March: 22 samples.
May: 11 samples.
June: 12 samples.
July: 26 samples.

The samples were either colorless, 15%, or yellow in color, 85%. Thirty-two per cent. were pale yellow, 27% deep yellow, and 26% yellow. The color and specific gravity varied with the

season and feed. During January, February and March they were as follows:

		Sp. G.	
Deep yellow	17	1000-1010	18
Yellow	16	1010-1020	17
Pale yellow	17	1020-1030	5
Colorless	1	1030-1050	11
	51		51

During May, June and July they were as follows:

		Sp. G.	
Deep yellow	11	1000-1010	28
Yellow	10	1010-1020	16
Pale yellow	14	1020-1030	5
Colorless	14	1030-1050	0
	49		49

Specific gravity ran from 1000-1049 and averaged 1014.

Reaction: Alkaline 82; neutral 10; amphoteric per cent. slightly acid 1.

Urea from 0.04%-4.04%.

Average, 1.06%.

Hippuric acid from 0.01%-4.15%.

Average, 1.17%.

Ammonia from none, 1.0161%.

Average, 0.0009%.

Total nitrogen from 0.11%-1.92%.

Average, 0.58%.

No sugar.

No albumen.

Microscopical Data—Squamous epithelial cells were observed in 63% of the specimens, and irregular vegetable cells in 44%. Amorphous matter was observed in 27%, and mucus corpuscles in 21%. Spiral vegetable cells were observed in 20%, and starch granules and calcium sulphate crystals in 13% each.

The normal urine of a dairy cow would, therefore, present an analysis approximately as follows: Color, yellow; specific gravity, 1014; reaction, alkaline; a slight flocculent precipitate, and occasionally a heavy white precipitate of calcium sulphate; urea, 1.06%; hippuric acid, 1.17%; ammonia, a trace; total nitrogen, 0.58%; no albumen; no sugar; microscopical examination: squamous epithelial cells, irregular and spiral vegetable cells, starch granules, calcium sulphate crystals and amorphous matter.

Good Draft Horses in Demand—The following clipping from a paper that states facts as it finds them, bears out our convictions that the horse is still, and always will be, the most practicable and economical form of traction, except for very long runs, when, in reality, the automobile replaces an express or freight train, rather than the horse. And the same applies to those that use it for long road runs in light work: "About the horse market the comment is constantly made that draft horses are the best sellers. This statement has already become commonplace. Anyone conversant with horse market activities would be surprised to hear any other assertion, and yet the fact remains that farmers are not producing top-notch draft horses in any considerable number. Judging by horse market receipts and a search of the countryside, farmers have a comparatively small appreciation for the advantages of breeding the largest horses.

"The fear of displacement by motor-trucks has some influence on farmers, but really motor power is not displacing the class of largest horses to any great extent. Dealers assert that motor-trucks have cut no appreciable inroads into their orders for first-class draft horses. Those who require the best teams pay almost any price in order to satisfy their requirements.

"As a consequence those farmers who are attempting to produce the right kind have not only the best possible present market, but very luminous prospects. An urgent demand has arisen this fall for the very best kind of draft mares. Every one of this sort would find a prompt buyer if offered for sale. Usually when one is located, inquiry reveals the fact that the owner is determined to keep her."—(*Breeders' Gazette.*)

THE MALLEIN TESTS.*

By C. J. Marshall, V.M.D., Philadelphia, Pa.

Pennsylvania began using mallein subcutaneously as a diagnostic agent for glanders in 1894. From that time to January 1, 1912, the records show that this test has been applied to six thousand, three hundred and three (6,303) horses and mules. During the same period one thousand and thirty-three horses and mules have been destroyed on account of glanders. It has never been the policy of the board to insist on destroying animals for glanders unless physical symptoms of the disease were present. All susceptible, exposed cases were placed in quarantine and kept there till the open cases have been destroyed or safely isolated, reactors only destroyed or passed a satisfactory retest, and the stables and other sources of infection have been disinfected.

It was believed to be unnecessary in cases with well-marked physical symptoms of glanders to conduct an autopsy. For these reasons we have but few post-mortem records until subsequent to January, 1912.

A veterinarian is required by law to report to the board all cases of glanders coming under his observation. Agents for the Society for the Prevention of Cruelty to Animals report a good many cases. In some places the board has made them agents and given them authority to quarantine suspected cases till a qualified agent can be gotten to make a diagnosis.

When a qualified, recognized veterinarian reports a case of glanders on a physical examination his diagnosis is accepted. He is then authorized to appraise and destroy the animal, place all exposed, susceptible animals in quarantine, and arrange to make a physical examination and apply a thermic mallein test as soon as possible to each animal in quarantine. Those that react positively may be appraised and destroyed or placed in

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strict quarantine. Those that show a doubtful reaction are placed in provisional quarantine and retested in from one to two months. They are subsequently dealt with as reactors or released according to the results of the tests. Animals that have passed the test are not allowed to be sold for three months from the time the last positive case was removed, or until they have passed the eye or serum tests. In a very few cases mallein has failed to give a characteristic reaction where it was known that the animal had glanders. On the other hand well-marked reactions have been obtained on the first test, would pass satisfactory subsequent tests and show no evidence of glanders for several years thereafter.

A characteristic reaction is understood to be one in which there is high temperature, painful swelling at point of injection, and physical depression. In the experience of the writer this combination is seldom found. It is the exception, not the rule. With it results are positive, easily interpreted, and a mistake will seldom be made by destroying an animal that has given such a reaction. Partial reactions are most common and they are not easily interpreted in all cases, even by those who have had a wide experience in using mallein.

Veterinarians as a rule in Pennsylvania have unlimited faith in the accuracy of tuberculin as a diagnostic agent for tuberculosis, and they seldom misinterpret the results of a tuberculin test. This is not true in reference to mallein.

Dr. M. Klimmer reports the recommendations made at the International Veterinary Congress, held in Budapest in 1905, in reference to the thermal mallein test. This may be found in his handbook on "Serum Therapy and Serum Diagnosis, Veterinary Medicine," Volume II., page 310 of the 1911 edition. Some facts are noted in reference to temperature, local swelling, etc., in typical and atypical reactions, and conditions are mentioned where atypical reactions may be expected. They are as follows:

The typical glanders temperature is 104° F. It should rise gradually, remain high till the second day and then fall grad-

ually. With such a temperature glanders should be diagnosed whether there is swelling or not at the point of injection. An atypical reaction may be lower or higher than 104° F. A swelling at the point of injection 6″ by 6″ is considered typical and glanders should be diagnosed irrespective of temperature. A renewed rise in temperature on the second or third day after injection should be considered positive. In all cases a retest should be applied in from ten to twenty days. Plain mallein or retest mallein may be used for this purpose.

The following conditions may reduce atypical reactions: (1) Spoiled or badly prepared mallein; (2) carelessness or inefficiency on the part of the operator; (3) advanced cases of glanders (physical diagnosis is usually easy in such cases); (4) marked emaciation from any cause; (5) exhaustion; (6) advanced age; (7) when antipyretics have been given.

In retests or where too small a dose of mallein has been used, one is more liable to get a typical swelling than a typical thermal reaction.

Dr. Klimmer also reports the results of his personal investigations on four thousand, seven hundred and eight (4,708) horses submitted to the thermal mallein test. Of this number, three thousand and forty-nine reacted and one thousand, six hundred and fifty-nine passed the test. All these animals were killed and carefully posted. Of the three thousand and forty-nine horses condemned, no lesions were found in two hundred and seventy-two. In the one thousand, six hundred and fifty-nine animals which passed the test, eight had lesions of glanders. According to these figures, for every twelve horses that react to the mallein one may be considered free from glanders. For those that pass a mallein test over two hundred might be killed before one would be found that showed the disease.

The results in Pennsylvania in the opinion of the writer would justify the above conclusions. Few glandered horses will escape the thermic mallein test. With this test there is much more danger of killing those that are free from glanders. For this reason horses that react to the thermic mallein test, but show no

suspicious physical symptoms should furnish additional proof that they have glanders before one is justified in destroying them. The ocular mallein test is very useful in such cases. Those that react to the ocular test may be destroyed safely. It is considered best, however, to hold all reactors for at least two weeks and collect samples of blood from each case from the serum tests and then submit them to a thermic mallein retest. Those that react a second time or have reacted to the eye, or either serum test, should be considered glandered and dealt with accordingly.

In acute glanders and other febrile diseases mallein should not be used subcutaneously on account of high temperature. It is less reliable in retests than in the original. There are numerous cases where other methods for diagnosing glanders must be resorted to if accurate results are to be obtained. Our board is fortunate in having recourse to the various laboratory forms of diagnosis. The laboratory furnishes indispensable service in this line. Aside from preparing mallein for the subcutaneous and ocular tests, diagnostic inoculations are made and the agglutination, complement fixation and precipitation tests are carried out. The board and the profession at large have unlimited faith in the laboratory report. Diagnostic inoculations are not satisfactory at all times for the reason that the animal frequently dies from some other disease. When a diagnosis has been established by this method it is considered most positive.

Our laboratory began using the agglutination test about 1908. Results were irregular and apparently fickle. Very little confidence has been established for this method of diagnosis from a practical point of view. In the past few months the results have been much better, and at present we have an abundance of confidence in the agglutination and the complement fixation tests.

While we have met with disappointments in the use of mallein we still believe that it is the most practical method for diagnosing glanders that is known at the present time. The various other methods are especially useful in assisting to establish a diagnosis, and most useful in preventing the destruction of those that

are free from glanders, when mallein cannot be used or when it fails to give a characteristic reaction.

About the first of the present year we began experimenting with a specially prepared mallein used in the eye. We have records of the ocular test on two hundred and one cases (fifty-three positive of glanders). It has been used in well-marked physical cases of glanders, exposed and healthy animals, and results have been uniformly satisfactory. Like mallein used subcutaneously, the original test is the most satisfactory. In some cases a slight thermal reaction is obtained, which is of diagnostic value. Where a subcutaneous test is applied in positive glanders subsequent to an ocular test the eye will sometimes react. The ocular test is easily applied and readily interpreted. The elevated initial temperature does not appear to interfere with results.

The following instructions are sent to practitioners in Pennsylvania for applying an ocular mallein test:

GLANDERS.

Scientific Principle—The animal body infected with glanders is hypersensitive to mallein to such a degree that this preparation given in small doses will cause at the seat of the application an inflammatory reaction; in large doses general symptoms (fever, or the well-known mallein reaction). The hypersensitiveness occurs under general conditions at the end of the third week after infection and reaches in the first month of the disease its maximum. (During the further development of the disease in from six months to two years it generally sinks down to the insensibility of healthy animals.) During this period conditions of increased sensitiveness may be detected.

Technique of the Test—The mallein (5 per cent. solution of dry mallein ["Foth"] in saline solution) is instilled into the conjunctival sac of the eye (quantity, 2 drops). A fine camel's hair brush can be used. The other eye serves a control.

Course and Interpretation of the Reaction—Immediately after the application, in practically all animals, lacrimation, reddening of the conjunctival membranes, photophobia, etc., will be noted. This primary reaction is *not* specific and disappears in

the next few hours. The specific reaction begins five to six hours after the application and has a duration of thirty-six to forty-eight hours, occasionally longer. The symptoms are a purulent conjunctivitis, reddening, swelling and purulent secretion. *The purulent secretion is typical.* Distinguish the following:

a. Positive Reaction—Purulent secretion in varying quantities; in small quantities always to be found in the inner canthus.

b. Negative Reaction—Absence of any secretion.

c. Doubtful Reaction—Slimy secreta or lacrimation after twenty-four hours.

The examination is made as early as twelve hours and as late as twenty-four hours after the application. A positive reaction indicates glanders. One negative test does not permit the elimination of suspicion, but after three weeks' repeated ophthalmic tests with negative results speaks against the presence of the disease in the animal tested.

Doubtful reactions support suspicion. In these cases a repetition of the test is recommended. The second test can be carried out in from one to thirty days. In this case a positive reaction supports the diagnosis of glanders. Should the second test be negative or doubtful, a third test should be applied in three weeks.

Fever and General Symptoms—Severe positive ophthalmic reactions run their course without fever and general symptoms. Latent infected animals are hypersensitive to such a degree that traces of mallein absorbed by the circulation cause a febrile reaction. It is therefore advisable to combine the ophthalmic test with a temperature test. Three temperatures are necessary—on at the time of the application and one at the time of each observation.

A doubtful ocular reaction can, by the simultaneous rise of temperature from a non-febrile state of the animal, be interpreted as positive.

Sources of Mistakes—(*a*) The ophthalmic test should not be applied in cases of existing conjunctivitis.

(*b*) By removing the purulent secretion (by manipulation of the stableman) a positive reaction may become indistinct. Usually in these cases a purulent secretion is found surrounding the eye.

(*c*) A positive reaction may be simulated by a voluntary or involuntary irritation of the eye (foreign bodies, etc.).

(*d*) In rare cases the reaction may be atypical. It may appear suddenly and disappear in a few hours or later and could not be detected till twenty-four hours or later. Both reactions are to be interpreted as "doubtful."

(*e*) In rare cases the untested eye reacts.

(*f*) There does not exist any correlation between the degree of the reaction and the degree of the pathological lesions.

The ocular mallein test conflicts in no way with the subcutaneous test.

Note—Mark the reactions as follows: P—positive, with figures 1, 2, 3 as to degree of pus; 1—little; 2—much; 3—abundant; N—negative; D—doubtful.

The ocular test is convenient and useful in stables where glanders is suspected or in an animal giving suspicious symptoms. If a serum test is to be made the blood should be obtained before or not for three to four weeks after mallein is injected. The ocular test may be used before or after the subcutaneous test. It is not considered advisable to use the two at the same time because during a febrile reaction the ocular reaction fades away.

Those that react to an ocular test and show suspicious physical symptoms may be appraised and destroyed at once or placed in rigid quarantine. Animals that react to the ocular test but show no physical symptoms should be isolated, sample of blood obtained and a subcutaneous mallein test applied as soon as possible. If the ocular reaction is confirmed by a reaction to the subcutaneous test or either of the sera tests, the animal should be considered glandered and dealt with accordingly.

Animals that are condemned for glanders by any test, yet show no physical symptoms of the disease, should be submitted to a careful post mortem. This has been done in Pennsylvania

since January 1, 1912. There are very few owners who have sufficient faith in any test and especially so if there are no physical symptoms present. The no-symptom cases must be gotten rid of if glanders is to be eliminated. There is very little chance for mistakes if the known diagnostic agents are carefully and intelligently used.

NOTES ON THE TRAPEZIUM IN THE EQUIDAE.—We have perused with much pleasure a discourse on the above subject extracted from the bulletin of the American Museum of Natural History, New York, from the pen of Mr. S. H. Chubb of that institution, illustrated, and believe it of the greatest interest to anatomists.

IN MEMORIAM—PAUL CASPAR FREER.—In the memorial number of the *Philippine Journal of Science* we have read with much feeling an obituary on Paul Caspar Freer, M.D., Ph.D., Director of the Bureau of Science of the Government of the Philippine Islands, Dean of the College of Medicine and Surgery and Professor of Chemistry of the University of the Philippines. Dr. Freer was also founder and editor-in-chief of the above journal. Although Dr. Freer died on the 17th of April last, the sorrow at his loss, in the hearts of his colleagues, is as deep now is it was at the time of his demise. In July, the members of the staff of the Bureau of Science, the Council of the University of the Philippines, and the members of the Philippine Islands Medical Association had a memorial meeting in honor of his memory and to give formal expression of their sorrow at the loss of their faithful and brilliant brother, who was so dear to them in life, and of such inestimable value to the interests of medicine in the Philippine Islands. Dr. Freer was born in Chicago, and at the time of his death was but fifty-one years old, and had he not been afflicted with arterio-sclerosis and acute nephritis, which carried him off, should have had his richest years ahead of him. He was a true friend to the Filipinos, and a solicitous protector of the Filipino youth, whom he encouraged to take up scientific work. His desire was to put as many Filipinos as possible in his bureau. His death causes a great loss to the cause of science in the Philippine Islands; greater than can ever be estimated.

THE EFFICIENCY OF ANTI-CHOLERA SERUM AS A CURATIVE AND PREVENTATIVE AGENT.*

By R. A. Craig, Agr. Exp. Sta., Purdue University, Lafayette, Ind.

For the past three years anti-cholera serum has been used for the protection of hogs against infection with the hog cholera virus, and in the treatment of this disease. The term anti-cholera serum as used in this paper is applied to defibrinated blood to which a preservative has been added. This blood is secured by bleeding a hog that has been hyperimmunized with cholera virus, usually blood from a hog having acute cholera, by injecting it directly or indirectly into the circulation of the animal. The production, distribution and use of this serum are controlled largely by live stock sanitary boards, state veterinarians and state experiment stations. The output of the state laboratories is supplemented by commercial laboratories that are usually located near stock yards where cholera and well hogs can be purchased cheaper than from the farmer.

In the late summer and fall hundreds of thousands of hogs die of cholera. In 1911 the loss from this disease was very heavy. In one county in Indiana 43,977 hogs, valued at $222,886, died, and in five other counties in the state the loss from cholera was 120,974 hogs, valued at $704,773. The loss in the six counties was nearly $1,000,000.

During the past year but a small percentage of the exposed and infected hogs were protected by vaccination or treated with serum. Thousands of infected, immature hogs were hurried to market, and the loss from this source may be considered about one-half as great as that due to the heavy death rate. Numerous articles describing anti-cholera serum published in the agricultural papers gave the farmers confidence in this new agent for combatting hog cholera and the demand for it greatly exceeded

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the supply. Commercial firms found a ready sale for this serum. Laboratories were made larger and new companies formed. Untrained men established laboratories and began producing serum without the advice of an experienced director. The field results were no better than could be expected. The use of serums lacking potency, "fake" preparations and vaccines and "specifics" have discouraged the use of a reliable serum. In one locality in Indiana anti-cholera serum has not been used, but because of the unsatisfactory and "fake" serums and vaccines with which the farmers' hogs have been vaccinated and treated, anti-cholera serum is condemned.

A short time ago a man who is a very prominent teacher of animal husbandry and who is influential with stockmen stated that his experience with the serum treatment or hog cholera was very unsatisfactory. He stated that within a few days after the treatment was used on the herd in his charge that the hogs began dying like flies. In this case the dissatisfaction was largely due to the person in charge of the herd not being properly informed regarding the heavy loss that may follow the treatment of an infected herd. The editor of the live stock department of a prominent agricultural paper states that in his talks with the stockmen he has found that about fifty per cent. of them condemn the serum. Many of the farmers in one state do not believe that the statistics stating the field results with serum as given out by the state authorities are true.

The careless testing of serum in order to determine its potency, and recommending too small a dose have resulted in heavy loss in herds vaccinated by the simultaneous method. In testing serum, blood of known virulence and highly susceptible pigs or young hogs should be used. Stockyard hogs, or hogs purchased from two different herds, should not be used in testing the same lot of serum, because of the variation in the susceptibility of different lots of young hogs to cholera. I have in my possession a letter written by a representative of a commercial company in which he states that they tested serum without using virulent blood test pigs or without determining the virul-

ence of the blood used. Last year a veterinarian who had trouble with septic infection in a herd of hogs that had been vaccinated sent a sample of the serum that was used to the laboratory. This serum contained strings of fibrin and septic organisms that produced fatal septicaemia in rabbits that were inoculated with it.

A large number of the healthy herds in which anti-cholera serum has been used have been given protective doses. The size of the protective dose recommended by commercial companies has varied from 5 c.c. to 25 c.c. and by state laboratories and a few commercial firms from 20 c.c. to 45 c.c. for hogs weighing up to seventy-five and one hundred pounds. The 5 c.c. and 10 c.c. doses recommended for immunizing hogs not exposed to disease was based on the claim that the serum produced by this firm possessed a high degree of potency. However, in districts where hog cholera prevailed, they recommended a full dose of 20 c.c. fifty pounds of body weight. If a herd of hogs has not been exposed to hog cholera, or is in no danger of becoming exposed to this disease, it is unnecessary to use serum. I have given this scale of doses for the purpose of showing the wide variation. Judging from the field results of the past year, the low doses recommended conferred little or no immunity.

When a non-infected herd of hogs is given serum alone, the immunity conferred is temporary, lasting from four to six weeks. Many of the farmers who had their herds temporarily immunized the past year, believed that the hogs were proof against cholera infection for at least six months, and were greatly disappointed and discouraged when the "vaccinated" animals developed hog cholera. Thousands of hogs that had cost the owners from fifty cents to one dollar per head to have dosed with anti-cholera serum became sick, were shipped to market or died. This has reacted on the control work in some localities.

There are many field conditions that may lead to complications in the simultaneous vaccination work. The natural immunity of a hog may be lowered by feeding, handling, etc., and certain individuals may prove more susceptible toward infection than others. I have found that hogs raised in a section of the

state where hog cholera seldom occurs make better hogs for virulent blood production than the hogs raised where hog cholera is prevalent every few years. A large number of stock hogs have been shipped into Indiana from Tennessee, Arkansas and Missouri during the last few years. These shipments are usually made during the late fall and winter. Changes in the climate, feed and handling lower the resistance of this class of hogs toward the disease, and this must be considered when vaccinating them.

The Purdue Agricultural Experiment Station distributes serum through the veterinarians. Nearly all of the simultaneous vaccination work is done by the practicing veterinarians, and we direct the work so far as possible. Unless they are in sympathy with the work and are willing to inform themselves regarding it, mistakes are sure to occur. Vaccination methods must vary so far as the quantity of serum used, care of the hogs, etc., because of the different conditions met with in the field. Poor judgment and careless methods on the part of the veterinarian may result in heavy losses. A few days ago I was informed that a veterinarian whom we have been furnishing with serum, mixed the virulent blood with the serum. This practitioner had visited our laboratory and received full instructions regarding methods.

It is not advisable to vaccinate pigs weighing less than fifty pounds by the simultaneous method. If the mother is vaccinated, or infection is present in the pens, the pigs should be given a protective dose of serum, and later given permanent protection, or vaccinated by the simultaneous method. The use of blood of low virulence and careless methods used in administering the blood and serum are not uncommon causes of hogs outgrowing their immunity.

Practically all of the vaccination work in Indiana is done in the permanently infected sections of the state. The use of anti-cholera serum for controlling an outbreak of hog cholera in a herd has frequently proven unsatisfactory. In order to prevent the spread of the disease in such a herd, I believe that it is necessary to take the body temperatures of all the hogs that do not

show visible symptoms. All hogs having normal temperatures should be vaccinated by the simultaneous method, and if treatment of the infected hogs is advisable, from one-half more to twice the vaccination dose should be administered. If the above method is not practiced, a large percentage of the non-infected hogs may develop cholera later and die, as frequently occurred the past year. Hog cholera virus may remain virulent for months and a few weeks' protection is of little help in preventing the spread of the disease.

Up to July, 1912, the Purdue Agricultural Experiment Station had produced about 4,000,000 c.c. of anti-cholera serum. Estimating the average dose of serum used at 40 c.c. this quantity was sufficient to vaccinate and treat about 100,000 hogs. We have had a great deal of trouble in securing the proper reports from the farmers, as they do not seem to understand just what we want. Very often they report the entire herd instead of only the animals vaccinated and treated as shown in the report of the veterinarian. This makes the report useless to us for statistical work. We have received complete reports from more than one-fifth of the hogs treated and vaccinated.

Previous to July 1, 1911, we received complete reports from 188 herds. The non-infected herds numbered 73, and contained 4,609 hogs. The loss following simultaneous vaccination was 104 head, or 2.25 per cent. Fifty-one of the non-infected herds had absolutely no loss. There were 115 infected herds numbering 8,071 hogs. The loss following treatment was 766 head or 9.5 per cent. Twenty-five of the infected herds had no loss.

For the year ending July 1, 1912, complete reports were received from 186 herds. Eighty-five herds containing 4,036 hogs had no infection at the time they were vaccinated by the simultaneous method. Thirty-seven, or 0.91 per cent. of the hogs died. All of this loss occurred in ten herds, numbering 1,272 hogs. One hundred and one infected herds, numbering 5,478 hogs, were treated. In these herds, 701 hogs died, or 12.8 per cent. In 89 of the infected herds there were 4,929 hogs, of which 1,529 showed infection. The loss in these latter herds was 677

head, showing that 55.7 per cent. of the sick hogs were saved. All of the non-infected hogs in the above herds were vaccinated by the simultaneous method.

Practicing veterinarians should realize more fully than at present the importance of the hog cholera control work. We should be slow in endorsing proprietary preparations sold by agents that do not represent a reputable firm. Such persons should not be allowed to make "demonstrations" before our clients, nor should we by any act or statement lead stockmen to believe that we are willing to recommend their product until we are able to prove that it is worthy of our professional approval. The average practitioner is not in position to test cholera remedies and vaccines, but he can inform himself regarding them by writing to the state or experiment station veterinarians. The hog cholera control work offers an opportunity for us to impress stockmen with the necessity of passing better laws for the control of animal diseases, to build state laboratories and add to our reputation as veterinarians.

HACKNEYS HOLDING THEIR OWN IN ENGLAND—The following extract from an article by G. T. Burrows in the *Breeders' Gazette* of October 16th is surely encouraging, and welcome news of the assured position of this wonderful little breed of horses in its native land in the face of mechanical contrivances to replace it; and if cities in this country were not permitted to render their streets dangerous by a scandalous form of pavement, their position would be just as assured here, and their popularity as great as in England: "Hackneys are selling just as well as ever in the old country. W. Burdett Coutts at his recent sale secured $12,179 for 48 head, or an average of a little over $225, chiefly for young stock. It is the opinion of this great breeder that the future of the high-class harness Hackney is clearer than it was two years ago. He believes the functions of motors have settled themselves. The pleasures of driving a team, a pair, or a single horse still remain. If the best breeding strains are held onto, English breeders would reap both honor and reward for having stepped in to prevent the desertion of an old breed." * * *

RECIPROCITY OF VETERINARY MEDICAL BOARDS ON AN EQUAL BASIS.*

By Jules F. Morel, M.D.C., Portland, Ore.

Considering the fact that the laws regulating the practice of veterinary medicine, surgery and dentistry in the various states differ in some instances, not so much from a medical standpoint, but in the preliminary requirements, this paper will take in view a number of states forming a group whose preliminary and medical requirements are uniform or nearly so. According to the different requirements to practice the veterinary profession in the United States, I think we may classify the above in five groups:

1. Those requiring a high-school graduation, or an equivalent, prior to the taking up of the study of veterinary medicine.

2. Those complying only with the rules and regulations established by the Association of Colleges of the American Veterinary Medical Association.

3. Those having no preliminary requirements whatever.

4. Those granting a license upon presentation of diploma.

5. Those having no veterinary laws whatever.

The object of this paper is not to make a plea for interstate reciprocity indiscriminately, but purely and simply on an *equal basis.* Therefore, the State Examining Board whose requirements demand a high-school education could not exchange a license with a state whose requirements are not equivalent, exception being taken where the candidate, besides having in his possession a state license issued under different conditions, would be a high-school graduate. There would be no question and no

* Presented to the Association of Veterinary Faculties and Examining Boards, at the A. V. M. A. meeting, Indianapolis, August, 1912.

reason whatever for a state board requiring an examination to reciprocate with a state granting a license upon presentation of a diploma. But there is a question when, and there should be a reason why, a state board refuses to grant a license to a graduate veterinarian whose requirements come up to the standard, who passed a successful examination before a State Examining Board, and who is refused a license to practice in a state whose requirements are equivalent to those of the state in which a license was issued previously. If a qualified veterinarian passes a successful examination in Iowa, for instance, and is granted a license to practice his profession as a veterinarian in Iowa, can anyone state why this veterinarian is not able and capable to practice his profession in the state of Oregon or Washington, without having to submit himself to another examination, providing Iowa's requirements, if not more stringent, are at least equivalent to those of the other states? If a man changes from one college or university to another institution of a similar character, he is generally given credit for the work he has done and accomplished successfully. By doing so the college or university registering the student is not only doing *justice* to the matriculant, but it is giving the right *recognition* which the other institution deserves, providing the latter comes up to the required standard. If our leading institutions of higher education take this stand, why should our state examining boards have any reason to differ and oppose themselves to what is generally accepted as fair and square to the student? Our state laws should make provision to that effect and recognize to its full value the requirements in force by other state boards. The idea of compelling an old practitioner of veterinary medicine and surgery to pass a state board examination, and meanwhile consider him on the same footing as a young graduate just out of college is, to my mind, a most unfair proposition and a great injustice to the veterinary profession. If a graduate veterinarian passes a successful examination before any state board in America, if, besides his veterinary training, he can comply with the preliminary requirements of a state in which he wishes to register, he should

be entitled to register without any further proceedings. In the later the moral and ethical question should be considered as well.

The medical profession of America has taken up this matter a long time ago and reciprocity exists between the examining boards of the various states in the Union, which allows a physician having once passed successfully a state board examination, to practice his profession in other states whose requirements are similar to the state in which he took the examination and subsequently secured a license.

Our states should give every examining board the privilege to consider the applicant's credentials before giving him a test and then give him an examination accordingly. The requirements of our state boards of to-day are such that an older practitioner is practically incapable of answering a great part of the questions asked him, and is consequently unable to pass a successful examination, and in many instances is completely barred out from practicing his profession in other states, in which, from a legal as well as a moral standpoint, he should be entitled to practice. Would you expect a graduate of from fifteen to twenty-five years ago to answer correctly the questions asked to-day in histology, pathology, bacteriology, etc., while a younger graduate taking the same examination had the opportunity to familiarize himself thoroughly with these subjects, which to-day form a most important part in the curriculum of our colleges? Is this fair competition? I will agree that every professional man should keep himself up to date and devote part of his time to the study of modern medicine and surgery, but notwithstanding the fact that a great number of us are doing so, are all practitioners able to do so, and are they all given an equal opportunity? No, of course not—with the exception of the practice of medicine, surgery and the study of modern therapeutics, he will undoubtedly be exceeding rusty in all branches covering the curriculum of the first two years spent in college.

Interstate reciprocity on an equal basis would only give an equal opportunity to the veterinarians to practice their profession in the different states of the Union. It is understood that

the object of this paper is not to indulge in or ask for registration by courtesy, for if the latter is to be taken up it must be on its merits. Registration by courtesy cannot be done on the same basis as reciprocity. Registration through reciprocity should be the object of the following considerations:

1. That all applicants for license be graduates from recognized veterinary colleges in good standing and repute, those recognized by the American Veterinary Medical Association.

2. That the applicants for license through reciprocity produce evidence that they have passed a successful examination before a state examining board.

3. That the statutes of the state in which the applicant passed on examination, require a test at least equivalent to the one given in the state in which he desires to register.

4. That in all cases where an examination has been given, the applicant receives due credit for the work he accomplished successfully.

5. That the examining board of the state in which application is being made for license, in case of mutual reciprocity, has the privilege to demand, whenever deemed necessary, the papers and grades of the applicant from the state in which examination was held.

6. That no license be issued to an applicant whose license has once been revoked.

7. That no *non-graduate* licenses be taken under consideration.

8. That all states reciprocating with one another adopt a uniform pass mark.

9. That all licenses be issued only on mutual reciprocity.

The only solution to my mind to give the American veterinarian an equal opportunity, after he had once produced his credentials and proven to be proficient in the practice of his profession, is the creation of a National Board of Veterinary Medical Examiners under the supervision of the American Medical

Association or the federal government, but as I am not wishing to deviate from the title of this paper, I will not aim to discuss this matter but will content myself with mentioning it.

My object is to ask for fairness and equality, giving the old as well as the young the opportunity that we are all looking for—a fair and square competition conducted along the most ethical lines possible and the abolishment of exclusion.

National Horse Show of America—Twenty-eighth Annual Exhibition, November 16-18-19-20-21-22-23, at Madison Square Garden, New York City; $40,000 in prizes, distributed amongst Thoroughbreds, Trotters, Hackneys, Morgans, Clydesdales, Roadsters, Heavy Harness Horses, Four-in-Hands, Ponies, in Harness and Under Saddle, Tandems, Saddle Horses, Officers' Chargers, Hunters, Jumpers and Polo Ponies. Surely the old Garden will be an interesting place that week and a day, and all fashionable New York and all horse lovers in general will manage to find their way to the arena and to the stalls where equine aristocracy will "receive" at some time during that period. Each horse show during the year has been reported as far exceeding previous years and the one at the "Garden" will exceed all of them. New York City veterinarians drop in at leisure moments, and find it both entertaining and educational. Many also come from a considerable distance, and find the time well spent.

Review Keeps Going One Better—Dr. Horace B. F. Jervis, of Houlton, Me., in renewing his subscription to the Review, writes: "Your valuable journal not only keeps up its usual high standard that it has had ever since its conception, but it goes one better all the time, and you can bet that I want a hand dealt me just as long as you continue the publication." The doctor states that they have just gotten a new meat inspection order running smoothly in his town, and hope by spring to have a new abbatoir built. He is surely to be congratulated, as it is largely through his efforts that this progressive step has been brought about.

HOG CHOLERA.*

W. S. Corlis, V.S., Mt. Vernon, N. Y.

We are all more or less familiar with hog cholera and occasionally are called on to investigate an outbreak among swine and to eliminate the disease from the herd, and it is up to us as veterinarians to go at it in a scientific and practical manner to get good results which are both pleasing to our client and profitable to ourselves. Personally I have had some experience along these lines and have seen some cases in different parts of this state, and prior to hog cholera serum becoming in vogue I had to rely entirely upon isolation, disinfection and prophylactic treatment to eradicate the trouble.

Recent researches and experiments along these lines have proven without a doubt that the prime factor of this disease is a filterable virus, and that after it gains access to the animal, during a period of incubation certain changes take place which eventually form pathological conditions styled by the profession hog cholera. We may have the true type of this disease or a combination from a mixed infection, in which condition I have failed to receive good results from the serum treatment.

As early as 1908, Dorset, Bolton, Salmon and Smith in their experiments began to realize that the *Bacillus cholerae suis*, theretofore supposed to be the cause of hog cholera, was not the true prime factor of the disease, and later experiments proved beyond a doubt the inoculation of virulent blood in a healthy pig would produce symptoms of this disease; and if recovery took place these same hogs when exposed to hog cholera pigs sickened and died. Along these lines after further experiments a serum was made and used with marked success on susceptible and exposed pigs which was found to check the mortality. It is needless for me to go into the morphology and characteristics of the

* Presented to the Central New York Veterinary Medical Association at Syracuse, June, 1912.

various organisms found in hog cholera. What I wish to convey to you to-day is a *résumé* of some of the practical experience which I have had in a few outbreaks and in which I have met with a more or less marked degree of success, namely, the mode of diagnosis, treatment and prophylaxy which may help to some extent in your daily practice.

Hog cholera is a disease that is disseminated more or less throughout the state and has hitherto been a loss to the breeders, and many who have had trouble in the past have learned by experience, to their sorrow, that the only thing to do if the disease breaks out is to make a general clean-up, segregate the unhealthy ones and slaughter the remainder. If I am called to examine a herd of swine that shows clinical symptoms of hog cholera I inquire when the first pig died, the duration of the illness, whether or not there have been any recent introductions, and the number of deaths. I then make a thorough examination. If I do not find the following clinical symptoms I endeavor to hold one or more autopsies.

Symptoms—Greenish, sticky discharge from eyes; conjunctiva reddened and eyes very weak to sunlight; cough not always present; emaciation; diarrhœa or obstinate constipation; erythematous condition of the skin; at times discoloration of skin on ears, flanks and under abdomen; staggering gait; hogs having tendency to huddle together under the litter and, upon being disturbed, getting up in a listless way and occasionally moaning or squealing; and once in a while one may be found in a delirious condition.

Post Mortem—Lesions depend altogether upon the type of disease and duration or length of time the disease has run, whether acute or chronic. In the acute type the intestines are involved and ulcerated and the spleen will be found to be engorged. Extravasations of blood will be found in the mucosa of the intestines and other parts of the body and glands; kidneys affected; petechial spots underneath capsule of kidney which can be more readily seen by removing the capsule. If the disease runs on for a short period the ulcerations of the bowels are more

clearly outlined and if seen once will always be remembered; they are necrotic, raised, projecting masses, no definite outlines but generally circular and ragged, and the distribution varies slightly; generally found in the cæcum and colon. At other times this disease takes on a pulmonary form with a portion of the lungs hepatized, and if long standing, by examining the outer surface of the diseased portion and pressing firmly on surface, small pus points will be quite discernible. I have seen these points without the application of any pressure. At other times I have found complication with pleuritis, with pericarditis, and with hydrothorax.

I have recently had an outbreak with a secondary invasion of a necrotic trouble, setting up lesions, ulceration of the lips and digits and pit-like ulcers of the bowels, due, I think, to *Bacillus microphorus*. In this case undoubtedly they had hog cholera. The serum treatment was used with some improvements. Later this other mixed infection was noticeable and I attributed it to the disease being conveyed from a similar disease of cattle, hoof-rot, on the same farm. The ears became necrotic, ulcers and sloughing took place and digits came off in a number of instances. These were treated with very little success.

As hog cholera is caused by an organism and liable to be transmitted, the chief aim is to determine the manner in which it is conveyed from one pig to another and to eliminate all possible chances of its being carried from an infected to a non-infected herd. The period of incubation varies from 5 to 25 days. Precautionary measures should be taken in the following way: Permit no introduction of hogs from infected pens or district for six months, and have later introductions kept under quarantine and observation for an indefinite period; inquire at time of purchase whether or not there have been any hogs so affected of late, as a chronic form of this disease is very dangerous and may be a factor of conveyance; and do not permit attendants of diseased pigs to come in contact with healthy ones under any conditions.

There are two methods of injection—simultaneous and serum

I have found the serum treatment very effectual in checking this disease in true form. The serum can be obtained from the New York State College at Ithaca, N. Y., in quantities on short notice and at a nominal figure.

Mode of Controlling, Securing and Preparing Pigs for Treatment—Have attendant stand directly behind your patient; pass a small, stout rope with slip noose over and in front of the nose, when patient's mouth will invariably open; draw slack up firmly on the jaw, pass in front and hold taut. Patient will lay back on feeling the tension. Then proceed to inject the serum. Cleanse the parts thoroughly with a good antiseptic lotion (I prefer creolin), having previously sterilized your hypodermic syringe. To each 100 pounds of pig inject 20 c.c.; smaller pigs in proportion. Have an assistant hold a small amount of 5 per cent. carbolic solution into which needle is dipped prior to injection of each individual. Select inner side of thigh midway between stifle and hip. Pass needle into muscular tissue one-half inch, drawing fold of skin up when relaxed so that there may be no possible chance of leakage before completing your work. Select out a few check pigs, equally distribute them throughout the herd and mark them for identification where cholera exists.

At a meeting of the West Raleigh, N. C., Board of Aldermen, on October 10, they voted $45,000 for an abbatoir and rendering plant.

Color in Horses and Mules—Lieut.-Col. Charles E. Woodruff, chief surgeon of the Western division of the army, maintains that gray and white horses live much longer in the tropics than darker-colored horses. Almost the only ones that survive ordinary ailments in Manila are said to be white, gray, roan and light yellow; among these, the white horses predominate. Of 100 Chinese mules bought for the Philippine constabulary in 1903, only four lived more than seven years, and these had milk-white hair and jet-black skin.

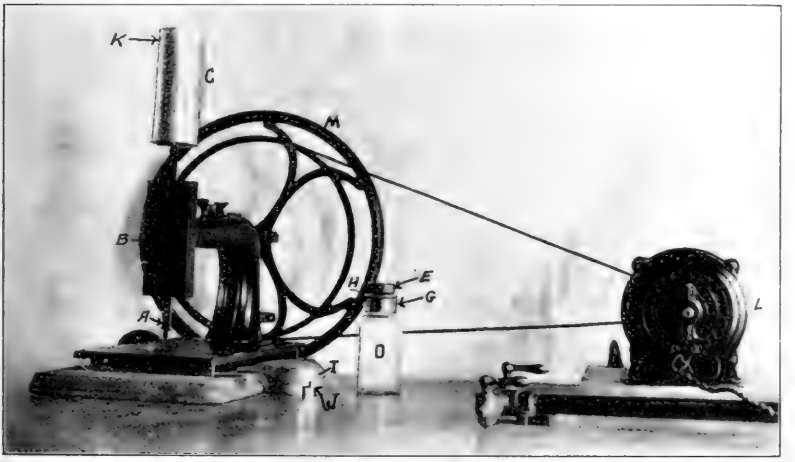
Colonel Woodruff says, "There is some unknown relation between color and nervousness. On review, the gray troop-horse is actually phlegmatic, the sorrel quiet, and the bays excitable and restless. Although, like all colors, black horses are sometimes quiet, they are believed to be the most excitable of all."—(*Our Dumb Animals.*)

A CHEAP BUT DURABLE SHAKING APPARATUS.

By B. F. Kaupp, Pathologist, Fort Collins, Colo.

After making considerable effort to purchase a shaking machine that would come up to my ideals, and having been told by several laboratory men that they built up their own shaking machines, I determined to try the building up process myself.

Dr. Burnett, of the University of Colorado, informed me that he had made use of the top of an old sewing machine in making



a shaker for the use in preparing bacterial vaccines and that he run the machine thus made by water power.

With this idea to start with, I determined to plan one suitable for shaking purposes in feces examination for animal parasites, for the making of antigen, bacterial emulsions in vaccine and opsonic work and in fact to generally meet the needs of general laboratory work.

I purchased the top part of an old sewing machine (see cut) for fifty cents. All parts were removed except the arm shaft

From the Laboratory of Pathology of the Div. Vet. Sci., Colorado State College.

and needle bar. The needle bar (a) was removed and lengthened by a smith till it projected about one and a half inches above the top of the parts in which the needle bar worked (b). An X-shaped piece was welded on the top of the needle bar to which the tin receptacle (c) is riveted. A six-ounce round bottle (d) was procured. The stopper (e) was paraffined so as to prevent leakage. A band was made to fasten around the neck of the bottle (g) and over the stopper. This is held together by aid of a screw (h). A snug fitting cap (i) with a slit (j) made in Z-shape which fits in a pin (k) soldered to and projecting from the top of the shaker receptacle.

A motor 1/10 horsepower (l) was procured (second hand). This has a speed of 3,400 revolutions. The smallest pulley on the motor is ¾ inch in diameter. To reduce the speed a band wheel from the under part of an old sewing machine was purchased for twenty-five cents. The balance wheel was removed and the band wheel (m) placed in its stead. This wheel has a diameter of 11 inches, and reduces the speed the desired amount.

Bacteria suspended in physiological salt solution may, if desired, be sealed in a test tube and packed in cotton in the shaker receptacle. The same process can be used in making antigen, etc., or the bottle with a paraffined stopper can be used as in feces examination for animal parasites.

The entire cost of the apparatus, including the motor, was $16.50.

Contract Given for Work on New Veterinary Building—The following clipping from the *Canadian Engineer*, Toronto, Canada, points to another step in the progress of veterinary education in America: "Toronto, Ont.—The Department of Public Works have awarded Messrs. Gearing Brothers the contracts for masonry and carpentry work on the new veterinary college on University Avenue. Excavation work has been completed and the construction of the foundation will begin at once. Tenders for the steel construction, brick work, plumbing and painting, etc., do not close for some time. Cost of college when completed will be over $200,000."

REPORTS OF CASES.

DEATH OF MULES DUE TO PARASITES.*

By Horace Bradley, D.V.S., Windsor, Mo.

Last fall Mr. J. C. Sims, of near Windsor, bought up twenty-five head of mule colts and two horse colts. On the afternoon of March 7 one of them died after being sick about six hours, and another one died that night that showed no signs of illness the evening before. The third was sick the morning of the 8th of March. I was called to see this case and found it very weak and unsteady on its feet; lips pendulous, mucous membrane pale, a slight mucus discharge from bowels, no perceptible pulse and temperature 98° F. It died while I was still there. There were two more than we imagined a little dumpish and we gave them each one quart of lard. They both died in about thirty-six hours.

They were all in good condition and the feed had been good quality corn, sheaf oats and straw with cottonseed meal, and the drinking water was from a deep well. I diagnosed the trouble as chemical poisoning due to continued feeding of cottonseed meal, and ordered the feeding of the meal discontinued. They continued to die, one about every two days.

March 13 the owner "smoked" several—a suggestion from someone. March 14 an unregistered man from Versailles was called and pronounced it influenza and put the colts on acetanilid and potassium nitrate. In the evening of March 15, Dr. Sheldon and I posted one by lantern light, and found peritonitis, petechial spots on liver and spleen, all lymphatics dark and enlarged, inflammation of diaphragm with adhesion of lungs to diaphragm, petechial spots on lungs, anti-mortem clot in heart extending 12 inches into anterior aorta, substance of kidneys very dark, bladder distended with dark urine, mucous coat of trachea very dark (possibly due to smoking). In the cæcum there were papery spots and areas denuded of mucous membrane, a dark, green-like mucus in small bowels. In the cæcum and colon were numerous parasites in all forms of development. We found some very minute ones in the inner wall of the intestines, which showed that they were being propagated under the sub-mucosa. Others

* Read before the Missouri Veterinary Medical Association, at Marshall, July, 1912.

sucking blood from the mucous membrane and millions of mature worms free, mixed with the fecal matter. We also posted another one early the next morning that died during the night, that confirmed the other. This one's temperature the evening before it died was 103.2° F., and on post mortem showed a decided yellowness of all tissues. We were not able to demonstrate any parasites in the blood vessels.

I sent specimens of the worms to Dr. J. W. Connoway and Dr. A. T. Kinsley and they reported the parasites to be of two varieties: the *Sclerastoma tetracanthum* and the *Sclerastoma equinum, or Strongylus armatus.* I believe the first named were in much greater numbers. Dr. Dunn, the Versailles man, was called again and still clung to his first diagnosis and divided them and gave one-half of them influenza antitoxin and left the other half for me to treat. I prescribed Cupri sulph. ♯ i, Ferri sulph. exc. ♯ iii and Sodium chloride ♯ xxv. Mixed and placed in trough where they could have free access to lick at will. In addition, I put them on Fl. ext. aloes, one tablespoonful every twelve hours until three doses were given, and one tablespoonful of iron on tongue twice a day. No more died after putting them on this treatment.

The influenza (?) cases continued to die until they were put on the iron treatment. There were 14 deaths covering a period of 18 days. The length of time from the first perceptible clinical sign of disease to death was from six hours to thirty-six hours, with the exception of one that lived three days.

The mortality of those that came down with the malady was 100 per cent. The entire herd were in good condition and carried a thrifty coat and were not anæmic or emaciated. I think the real cause of death was a toxemia and not a mere malnutrition, as one would expect to be produced by these parasites.

SOME CASES TREATED WITH ANTIPERIOSTIN.*

By Drs. Eberll and Knoll, Friedenau, Germany.

In conjunction with the paper by Dr. Boehme on the treatment of galls, exostoses, etc., with antiperiostin, we shall only briefly outline a few cases; the chemical composition, mode of

* Tieraerztl. Rundschau No. 37, 1912.

action, and method of application having been fully considered in the article by Dr. Boehme.

Treatment with antiperiostin is far superior to other methods of applying irritants, in that the animal is ready for work within 48 hours. Not only is absorption in the deeper tissues promoted, but there is also formed a firm crust which acts like a compress. Antiperiostin has been tested in a great number of cases, and in the most varied pathological conditions; the results have been surprisingly good, and we feel fully warranted in concluding that antiperiostin is undoubtedly of the greatest merit in the treatment of exostoses, galls and periostitis. Our own results with it were decidedly good, and obviously this can be expected only when treatment is instituted early. In a recent periostitis, in which treatment was begun at once, the swelling subsided quickly and completely. Besides the bony enlargement there was also considerable lameness, which on completion of the treatment had also entirely vanished. In an obstinate case of shoulder lameness, decided improvement followed, though there was not an entire cure. In two cases with quite large exostoses, no enlargement was afterward palpable. In both, the hair was renewed on the small bare patches. Spavin was not treated as the cases presented marked joint changes and could give no promise of ultimate cure. Many cases of galls were treated, and we observed a very good result in a case of extensive gall of the hock, the resorption being quite complete.

One *great superiority* of antiperiostin *over similar remedies is the facility of application, and its intense action.* When we consider that firing and irritant applications always are inconvenient to use, and the animals are thereby incapacitated for work for quite a long time, we can all the more appreciate the merits of antiperiostin. Furthermore, we must remember that the action of antiperiostin begins almost at once, and renders other measures superfluous. As in other methods of treating spavin, it is a good prophylactic measure to sling the animals and to anoint the adjacent skin in order to avoid dermatitis and stomatitis.

From its chemical composition, we would expect a very intense, even drastic action. Whenever strong irritants are used, the hair on the treated area may disappear after removal of the crust, and hairless granulating wounds remain which only gradually again become covered with hair. This result may also follow the use of antiperiostin. In our own cases, the hair was always renewed, though in some cases only after a long time. Dilution of the remedy (2 antiperiostin, 1 alcohol), however,

would prevent this baldness. When necessary to promote the growth of the hair we would recommend the mixture suggested by Wachs:

℞ Ac. Salicylic 5.0
Ol. Olivæ..... 50.0
Bals. Peruv..... 2.5
ft. Ungt.

TOXEMIA IN MULES FROM WEEDS.

By A. T. Ferguson, D.V.S., Evansville, Ind.

On August 20, at 5 p. m., I received a hurry call by telephone to Yankeetown, 16 miles from Evansville, to Nathan Taylor's, a farmer, who had 35 mules in a pasture. Dr. J. J. Burns, of Evansville, and Dr. Hartley, of Rockport, were already on the premises. On my arrival I found five dead and two others down ready to pass in their checks.

The history from the farmer was that in the morning the animals seemed all right, but shortly after noon they were found dead; the two that were still living appeared to be in no pain whatever, the pulse was almost imperceptible, the respiration not much changed, but a marked inclination to remain in a state of coma with little or no effort to regain their feet. Post mortem on these animals revealed but little to indicate the source of the trouble; the whole of the internal organs were normal; some urine in the bladder was clear but not white; the only lesions found were three small patches of hyperinea in the large colon which were not of any consequence. The blood was conspicuous for its small amount, and of a very dark, almost black color. The stomach when opened was found to be full of undigested vegetation which gave off an aroma somewhat resembling that of cinnamon. In the pyloric there was found a precipitate which resembled a mucus, a grayish substance that I believed was thrown off from the food eaten and picked up by the circulation, causing a thickening of the blood and thereby hindering the circulation and causing death.

Previous to this there had been a heavy downpour of rain for several hours, and of course all vegetation was saturated.

It is a well-known fact that some herbs eaten when the dew is standing on them, or they are saturated with moisture, become injurious when taken into the stomach, and that might possibly have had something to do with these animals dying, they being

out to pasture through the whole of the time it was raining, and none were known to have died before in this particular pasture.

The loss was estimated at about $1,500 to $2,000.

DYSTOKIA IN A COW FROM AN UNUSUAL CAUSE.

By Alonzo Weekes, V.S., Bridgetown, Barbados, W. I.

On March 14th, I was called to attend a cow, the property of Mr. Rupert McKenzie (Barbados).

The animal had been suffering during the whole night in difficult parturition. At 5 a. m. I found the cow lying in the yard, with the head, fore-feet and shoulders of the calf out, in the correct position.

The cow had been in this condition for six hours before I saw her.

When ordinary methods for the calf's removal were ineffectual, I inserted my hand in order to diagnose the cause, and discovered the calf to be of an abnormal size in its abdominal region, and so unable to pass through the pelvis.

By means of a scalpel, I opened its abdomen, and removed two sarcomatous tumors resembling cauliflowers in form, each weighing about ten pounds, and each enclosed in a membraneous sac.

After the removal of these abnormal growths there was no further difficulty experienced in dealing with the case.

This is the first case of this sort that I have met with in the course of twenty-five years' veterinary practice, and may perhaps be of sufficient interest for publication in your valuable periodical.

LONG HAIR ON HOG IN HOT CLIMATE—HERMAPHRODITE HEIFER.

By R. A. Stoute, D.V.S., Branksmier, Barbados, W. I.

I enclose a small piece of skin from a hog, not having seen one like it previously. The entire body was covered with hair of such length that I thought it uncommon, at least for a hot climate, so forward same to you.

We slaughtered last week a hermaphrodite heifer. She had two testicles in place of ovaries.

[NOTE.—The hair on the piece of skin referred to above is three inches in length and very fine, soft and silky in texture. We have shown it to a number of veterinarians and stockmen, none of whom have identified it as hog's hide and hair, which did surprise us much, as Dr. Stoute, who has been a constant reader of THE REVIEW for nearly *thirty years,* is a man of extensive experience, and he regards it as uncommon.—*Editor.*]

F. S. BILLINGS DEAD—Word has just reached us of the sudden death of Dr. Frank S. Billings at his home near Boston.

DR. JAS. A. RUDOLPH, for two years meat and milk inspector at Anderson, S. C., began his duties as food inspector at Raleigh October 7.

DR. F. W. MACKIE, Baltimore, Md., was operated upon for appendicitis on October 16, 1912. His many friends throughout the country will be glad to learn that the operation was successful and that the doctor is now safely convalescent.

DEAN COATES OF THE NEW YORK-AMERICAN VETERINARY COLLEGE (Division of Veterinary Medicine—New York University) attended the exercises in connection with the official opening of the new buildings of the Department of Education at Albany (N. Y.) week of October 14, 1912.

NEW READING ROOM FOR AGRICULTURAL STUDENTS—The College of Agriculture of the University of Illinois has opened a commodious reading room, where its 800 agricultural students will have ready access to the leading agricultural papers and books and periodicals on allied subjects.

FUNK AND WAGNALLS COMPANY, New York, have secured the American rights to *"A System of Surgery,"* edited by C. C. Choyce, dean of and teacher of Operative Surgery in the London School of Clinical Medicine, etc., etc. Published in three volumes; the first was ready in April, and the remaining two will be published about autumn, 1912. The price of the work will be $21.00 per set.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Adenoma of the Prostate and Adeno-Carcinoma of the Liver in a Dog [*Prof. Geo. H. Wooldridge, F.R.C.V.S.*].—A male fox terrier of fourteen years was getting thin and lost appetite. On examining the abdomen a firm, hard body is felt in front of the pubis. The general functions are nearly normal and the dog micturates naturally. The growth resembles a tensely distended bladder. An exploring puncture was negative. Explorating laparotomy is advised. The dog received an injection of morphine followed by chloroform. Although this was very carefully administered, hydrocyanic acid and artificial respiration had to be resorted to on account of the extreme weakness of the dog. After thorough disinfection the abdomen was opened by an incision made a little on one side of the penis and the enlarged mass brought out. It proved to be a huge prostate with the much smaller bladder lying on it. The prostate was dissected out, but a small incision of the urethra could not be avoided. This was closed with sutures and the abdominal wound sewed; then dried with ether and collodion. The patient did well for the next twenty-four hours, but after that grew weaker and died forty hours after the operation. At the post-mortem the process of cicatrization was found perfect. There were two tumors in the liver, one weighing 11 ounces and the other 2½. The prostate mass weighed 28 ounces. The microscopic examination of this last revealed it to be an adenoma and that of the hepatic tumors adeno-carcinoma.—(*Journ. of Comp. Path. and Therap.*)

Echinococcus Cyst in the Brain of a Mare [*Prof. A. Gofton, M.R.C.V.S.*].—This animal was nine years old and since four years has done her work well in a light surrey. She is taken to the blacksmith shop, and while being shod it is difficult to raise or hold up her legs. When she goes back home, she staggers, has several falls and an hour later she has a sleepy appearance, her head is held down, the eyelids drooping, pupils are dilated. She has little control of her legs. In the evening she

is stretched on the ground unconscious. Her temperature is subnormal, 98° F., pulse weak and irregular. She has convulsive spasms of the muscles, principally of the limbs. The mare is destroyed. Examination of the head revealed the presence of a cyst on the left side of the brain, mainly within the ventricle, whose surface was roughened. The cyst was tense and on incision allowed the escape of greenish-yellow turbid fluid. By examination of the lining membrane of the cyst, small cyst-like bodies were noticed in which a number of heads or scolices of a tapeworm bearing the closest resemblance to those of taenia echinococcus, which they were indeed.—(*Journ. of Comp. Path. and Therap.*)

Teratology [*W. M. Scott, F.R.C.V.S.*].—Under this title the writer, referring to the influences of emotions, relates the following:

"I was requested to deliver a heifer, the foetus appeared to be about six months, and beyond the fact of it being a monster type, no further notice was taken of it. The following evening in the same establishment a similar delivery was made, another monster. Two days later another call in the same barn and again another heifer was delivered of a foetus practically identical to the second. On inquiring if at any time the heifers had been hunted or frightened by dogs, the information came that two men had slept one night in a quarry, which is in the field where the heifers were kept, and that they had with them a dancing bear and the next morning the heifers were found run-running like mad things, switching their tails. These three cases of dystokia were due to monster development brought about by mental disturbances, at least so far as the author can see.—(*Vet. Record.*)

Abdominal Surgery in the Horse [*Prof. H. A. Woodruff, M.R.C.V.S.*].—Aged hackney mare had colic, is off her food, temperature 102° F., and passed no dung. Her rectum had to be emptied and that organ appeared sore and very irritable. The animal was not tympanitic. Examination per rectum revealed a large rent on the right side of the bowel with a large collection of feces in a pouch outside the rectum. Very offensive smell and shreds of necrosed connective tissue are noticed. There is no peritonitis. Prognosis is serious and colotomy advised. After due preparation, with the animal cast on off side, an incision was made through the abdominal walls, the abdominal

cavity open and a loop of the floating colon withdrawn. "This was secured by passing a steel rod behind the summit of the loop through the mesentery. Rolls of sterilized gauze were used to pack the opening in the flank round about the knuckle of intestine, and finally an opening was made into the bowel with a hot iron so as to prevent hemorrhages. A few pellets of feces were passed out through the hole and the patient allowed to recover from the anesthetic. On getting back to the stable enema was given in the upper part of the gut, removed great quantity of feces, whilst the lower part, including the rectum and the extra-rectal pouch, were thoroughly washed out with chinosol lotion." After a few days when adhesions had formed round the knuckle of bowel, this was cut off with the actual cautery and two openings were left in the flank with the skin and muscles contracting round them. Recovery went on well with exception that the passage of liquid feces, due to the mode of diet, caused some soreness of the skin below the artificial anus. Normal more solid food remedied that trouble. After five weeks the animal had made up her condition. The laceration of the rectum had healed and feces would have passed in the natural way, if the continuity of the bowel had been again re-established. This was attempted by another operation, of bringing the two ends of the bowel, the two artificial anus end to end. They were dissected clear from skin and muscles, and a short piece of each was amputated and an end to end anastomosis completed. The closing of the wound of the skin that followed was rather difficult. The operation was long and the animal suffered much from shock. She died two days after with septic infection, due probably to the soiling of the edges of the wound with fœcal matter. —(*Veter. News.*)

Double Fracture of the Premaxilla in a Horse [*D. Forwell, M.R.C.V.S.*].—Aged nag gelding refuses his food and his upper lip is twisted on one side. In opening the mouth, the writer finds a double fracture, one large, dividing the premaxilla down the middle between the central incisor teeth and extending for over two inches above the incisor arch. The other is smaller and between the corner and latral incisor teeth. Between the fractures food has collected. Through two holes made in the bone and palatine plates, one on the outside of the central fracture and the other on the outside of the small fracture, copper wire was inserted so as to bring the bones and teeth firmly together and to make this more secure a groove was cut on the

outside of the two corners and wire fixed round them, bringing the whole firmly together. Sloppy bran mashes and crushed oats was allowed for three weeks. Then grass for a little time until after one month more the wires were removed. Recovery was perfect.—(*Vet. Journ.*)

Sinus in the Abdominal Wall of a Filly [*Prof. J. J. O'Connor, M.R.C.V.S.*].—With unknown history a nice three-year-old filly was bought. She had a running sore in near flank. A sinus in the lower part of the flank discharged white, creamy pus. It extends from the lower part of the flank along the lower part of the left abdominal wall to about four inches behind the elbow. It runs a little more than one inch in depth from the skin. Free opening at the bottom of the tract, also about the middle, the cavity is thoroughly washed out and setons inserted. In a few days these were removed and lesions demanded no further treatment, cicatrization went on rapidly.—(*Ibidem.*)

FRENCH REVIEW.

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

Removal of the Mammæ in a Mare [*W. Huret, Army Veterinarian*].—This mare was ten years old and of rather ugly disposition. One night it is supposed that she kicked over the moving bar of her stall and she has a swelling of the right mammæ which soon becomes an abscess, which was very long to treat. After some time she had resumed her work and is again laid up. The mammæ is enormously large, with old and recent fistulous tracts. An operation of removal is indicated. The mare is thrown, chloroformed, put and held in dorsal position, the hind leg next to the tumor being removed from the hobble. After disinfecting, an incision 37 centimetres long is made on the median line which separates both mammæ and another curve joining the first at both ends and having between them a piece of skin adherent to the tumor and maculated with cicatrices of fistulæ. The dissection of the tumor was then proceeded with. Large veins were ligated in front, behind and between the mammæ, and a large vascular trunk as big as a testicular cord was divided with the ecraseur. The mass weighed 1 kilog. .020, and the cavity left open without dressing for fear that the stitches would tear the fine skin of the region with the

efforts for micturition. Two secondary hemorrhages occurred, one from an artery and from a large vein. Those were arrested and the vessels secured with double ligature and forcipressure nippers, which were left in place for forty-eight hours. The wound took two months to heal and the suppuration was very abundant. When some time after—the mare being destroyed because of suppurative synovitis of one foreleg—the cicatrization of the removed udder was found perfect and regular with skin perfectly supple without adherence or retraction.—(*Bullet. de la Soc. Cent.*)

Dog with Tuberculosis of the Myocardium [*MM.L. and E. Lepinay*].—Post-mortem record of a spaniel dog, six years old, which took severe cold after exposure to dampness and rain at a day's shooting, and to which the test of tuberculin was applied to confirm a diagnosis of suspected tuberculosis. The test, 3 drops of diluted tuberculin injected subcutaneously, proved fatal to the dog. At the autopsy the pleura were found adherent in several places. The lungs, tracheo-bronchial glands and the base of the heart formed a large caseous mass. The lungs were filled with miliary tubercles. The heart was normal in size, with the pericardium adherent in almost its whole surface. The myocardium contained also caseous deposits of various size. The pulmonary artery was atheromatous. The liver and the kidneys presented also caseous tubercles of small size. The kidneys principally had cavities and miliary granulations.—(*Rev. de Path. Comp.*)

Sub-Lingual and Sus-Thyroidal Ranula in a Dog [*Mr. G. Monbet, Army Veterinarian*].—This case, relieved by radical treatment through the mouth and cervical region, is rather interesting. Four-year-old pointer has on the left upper part of the neck a subcutaneous tumor not adherent to the skin and painless. Looking in his mouth, another is found on the left side of the lingual frenum. This is soft, fluctuating and pushing the tongue to the right. The two growths are not communicating. The dog is anæsthetized and the cervical region disinfected. An incision through the skin exposed the tumor, which appears with thin walls and reddish coloration. It is isolated carefully with the blunt end of the directory and when the branches of the thyroid cartilage are about reached, a strong catgut ligature is applied and the cyst removed. It contains oily, reddish fluid. The wound was drained and closed. Then the mouth being widely

open, the tumor within was also dissected as deep as possible, removing with it a little of the mucous membrane; quite large hemorrhage occurred during the dissection. The contents of this tumor was similar to that of the other. The recovery was regular with the exception of a small collection which returned in the neck some twenty days after, and was relieved by punctures.—(*Rev. Gen. de M. Vet.*)

Generalized Melano-Sarcoma in a Dog [*Prof. Petit, Douville and Germain, Adjuncts*].—Exceptionally rare in dog, this case of melanosis has a still greater importance from the fact that it was observed in a black French poodle, the most pigmented breed of dogs.

This *caniche* had on the inferior face of the tail two small, hairless, black warts which, when the animal was clipped, were cut off by the scissors of the clipper. They bled a little but never cicatrized. They were replaced by two red, bleeding granulations which remained rebellious to all treatment and necessitated the amputation of the tail. After three months of care and varied therapeutic applications the unhealed stump is covered with granulations, blackish and suppurating. A fœtid odor exists. The ischial lymphatic glands are hypertrophied. The general condition of the dog is bad, he has lost flesh, eats poorly, is constipated. Tonic treatment is prescribed besides special indications for the condition of the tail. Rectal examination reveals then hypertrophy of the sublumbar and prepelvic glands. The ischials suppurate, thick and blackish discharge. Cachexia becomes more and more marked; the dog dies. At the post mortem: Three melanotic nuclei at the base of the tail; neoplasic chain extending from the caudal vertebræ to the sacro-iliac joint. Some of those are subcutaneous, others intramuscular. In the abdomen, omentum and peritoneum are covered with small, black, granular deposits. Melanosis is found in the mesenteric glands. In the intestines, in the kidneys, the suprarenal capsulæ, some black, others grayish. The spleen has two enormous infractus; the liver has several. In the thoracic cavity the deposits are also observed on the pleura, in the diaphragm. The lungs are literally packed with them. The heart is not exempt from deposits; both auricles are principally affected. On the right ventricle there is a small nucleus, and toward the point of the heart a superficial blood vessel is obliterated with a black embolism clot. The nervous system alone was free from lesions. Histologically ex-

amined, these lesions belong to the fasciculated type of melanic sarcoma.—(*Bullet. de la Soc. Cent.*)

Piroplasmosis in the Horse [*Mr. L. Kowalewsky.*].—In one case the horse belonged to a stable of eleven animals. Two were found with glanders. Of the remaining suspects one injured his left eye and face. The temperature was 39°. General condition good. His temperature rose to 40° and 41°, where it remained for two days. One day he was found lying down unable to get up and he showed paresia of the extremities. Sensibility normal. Examination of the blood and test of Wasserman gave a positive result of glanders. Preparations of the blood by Gram's method revealed the presence of piroplasm in quite numerous quantity.

In another occasion, four cases were detected in the effective of an artillery battery. Quinine internally and subcutaneous injections of camphorated oil cured them.

In another animal the following symptoms were observed: During eight days, at the onset of the disease, the temperature rose to 40° and higher. The animal was dull, with great general depression. Anorexia complete, movements stiff, accompanied with titubation in walking. Buccal mucous anhemic, conjunctiva purplish red. Bloody tears escape from the external commissure of the lids. He also recovered with the same treatment.—(*Journ. de Zootech.*)

Ingestion of Tar Causes Stercoral Obstruction [*MM. Leuret and Perreau*].—The history of the case was that the animal was sick since five days with colic; pawing, looking at his flank, laying down carefully and rolling. He has received castor oil and pilocarpine with rectal injections without benefit. He continued in the same condition, throwing out with the injections little hard feces. He makes continuous efforts. Micturition is frequent, painful; only a small quantity of urine is expelled. With these same manifestations it is noticed that the animal is tympanitic; there is no pain on pressure of the abdomen. The loins are stiff, pulse small and frequent, respiration short, accelerated, labored and irregular. There are efforts for defecation without results. The animal dies in a few hours. At the post mortem there was found, 50 centimetres from large colon, in the small colon full of gas, a large stercoral mass which closed and obstructed the canal. This mass weighed 520 grams

and showed in its centre a nucleus of tar, partly dried up. It seems that the stable where the horse was there was also a certain quantity of tar which the horse could reach. He did reach it and died for it.—*(Journ. de Zootech.)*

LAST WORD FROM WASHINGTON ON THE EPIZOOTIC IN KANSAS AND NEBRASKA—Just before closing our forms we are in receipt of the following letter from Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, which corroborates the Bureau's former report. Dr. Melvin says: "Replying to your letter of October 15, relative to the epizootic which recently caused the deaths of so many horses in Kansas and Nebraska, you are advised that within the past two weeks the disease has suddenly disappeared. During this period there was a sudden change in temperature over the territory involved, with several frosty nights, lower humidity and cooler weather, and the disappearance of the disease in the range horses has been attributed to these changes in climatic conditions. On many farms where the advice given by Bureau inspectors, as to the removal of animals from contaminated pastures, was heeded, the disease disappeared as completely as where other measures were adopted in addition thereto, such as the vaccination of animals with bacterins made from various organisms isolated from dead animals, but which up to the present time have not been proved to have any vital connection with the disease.

"From numerous observations made in the field it appears that either the forage or water or both were the carriers, if not the direct cause, of the malady, and all our recent investigations merely serve to substantiate the original diagnosis of forage poisoning. Many molds have been isolated from the damaged forage and various bacteria have been obtained from a number of horses dead of the disease, but these have not yet been sufficiently studied and experimented with to justify an opinion as to their etiological significance. A large number of horses suitable for bacteriological investigation gave negative results as far as the isolation of organisms was concerned.

"Up to the present time the Bureau is not in possession of definite knowledge of the specific cause of the affection, but the investigation is to be pushed to a final conclusion relative to the possibility of the various organisms isolated or their toxins having some causal relation to the disease."

The above report also agrees in the main with the findings of Professor Kinsley, published on pages 234 to 237 of this issue of the REVIEW, and with those of Dr. John Reichel, Philadelphia, which we have just read in *Mulford's Veterinary Bulletin* for October.

OBITUARY.

GEORGE B. WELLS, D.V.M.

Dr. George B. Wells died at the Winsted Hospital the last week in September, where he had been taken from his home in Canaan, the day previously, in the thirty-sixth year of his age. The doctor was taken ill suddenly on Saturday night, and his physician was summoned, who found trouble with his throat, which was swollen so badly that he could not swallow, and had difficulty in breathing. The condition continuing to grow worse, his physician took him to the hospital on Sunday, but all treatment failed, and he died early on Monday morning by suffocation. Malignant septic infection was thought to be the trouble; the infection probably having been received while operating on a cow.

Dr. Wells was born in Hancock, Mass., on February 21, 1877, and received his early education in the public schools of that place. When a young man he went to New York, where he followed a mercantile career for several years; after which he attended Mt. Herman School at Northfield, Mass., for two years, prior to entering the veterinary school of Ohio State University, from which institution he graduated in 1908.

After graduation, he accepted a position in the government service, and was stationed at Chicago as a meat inspector, which position he held for three years, when in October, 1911, he resigned to take up private practice at Bennington, Vt. He remained in Bennington until June, 1912, when he succeeded Dr. G. E. Corwin, at Canaan, Connecticut.

Dr. Wells was unmarried. He is survived by his father, C. H. Wells, of Hancock, Mass., and a sister, Mrs. Sarah J. Conklin, of the same place.

WALTER AMOS, V.S.

Dr. Walter Amos died at his home in Owatonna, Minnesota, on October 6, 1912, at the age of forty-eight years. Dr. Amos was born at Guelph, Ontario, Canada, in 1864, and spent his early life in teaching school in that Province before he took up the

study of veterinary medicine. He received his veterinary tuition at the Ontario Veterinary College, from which institution he graduated in 1888; and shortly after began to practise his profession in Owatonna, Minnesota, and remained there up to the time of his death. He was at one time president of the Minnesota State Veterinary Medical Association, and was president of the State Examining Board of Minnesota at the time of his death; in fact was one of the most active and enthusiastic workers for elevation of his chosen profession in his state. Dr. Amos was of Scotch descent, and of a kind, genial disposition that made him many warm friends, who will deeply miss him from their midst.

United States Live Stock Sanitary Association.—Believing that the circulation of the following letter from Secretary Ferguson of the United States Live Stock Sanitary Association, outside of the membership of that organization will do as much, as if not more good than its circulation within the membership, who already know of the greatness and the importance of its work, we reproduce it here:

PLACE OF MEETING 1912.

The Sixteenth Annual Meeting of this Association will be held in Chicago, Tuesday and Wednesday, December 3 and 4. The success of our last meeting should be an incentive to every member to use his best personal effort to make this year's meeting the best ever held. Our membership is steadily increasing, but should be much larger. Every member is asked to make it his special business to send in at least one application for membership before the next meeting. Old members, who are in arrears for dues, please remit as soon as possible. We are already at work on material for programme. Members are urged to forward programme suggestions immediately. If you know of any discovery of value during the year or anything specially noteworthy in legislation, send me the name of the man who could handle the subject at our meeting. Do not forget that the success of the meeting depends upon the effort and co-operation of individual members.

Yours respectfully,

J. J. Ferguson, Secretary-Treasurer.

Union Stock Yards, Chicago, Ill.

CORRESPONDENCE.

TO THE VETERINARY PROFESSION OF AMERICA.

The next meeting of the American Veterinary Medical Association to be held in New York City, September 1-5, 1913, will be an epoch-making event in the history of our organization. This gathering will celebrate the Fiftieth Anniversary of the greatest veterinary association in the world, and should represent an index of the growth and progress of our profession in America. The remarkable strides with which veterinary science has advanced in the past decade, and the general recognition which it has attained in its progress, go hand in hand with the growth and development of the American Association. All the measures looking towards the advancement of the veterinary profession in America have always been materially and morally supported by this Association, and one cannot help but regard it as the highest power in our struggle for greater recognition. State legislative measures concerning the betterment of the veterinary profession have been invariably advocated and aided by the Association; its stand for higher education has been of incalculable value in producing the present high standard in our veterinary colleges. The determined effort to obtain rank for the veterinarians in the U. S. Army is gradually nearing success, and this has been due almost entirely to the emphatic stand and work of the Association. Thus, it is readily apparent that the American Veterinary Medical Association has been and will continue to be the pioneer in all of our struggles. "Progress" is and will be its by-word, and we shall soon see the day when members of the veterinary profession will be honored like the members of our sister professions.

The remarkable success of the American Veterinary Medical Association during its fifty years of existence can be well accredited to the devotion and enthusiasm of its members. They have always shown a willingness to throw themselves into any struggle for the benefit of the Association and profession without consideration of the odds against them. Most members of the veterinary profession are cognizant of the advantages which they now enjoy through the work of the A.V.M.A., and year after year records are broken in the enrollment of new members. It is only natural that the strength and influence of an organization

are in direct proportion to its membership. There are in the United States and Canada thousands of veterinarians eligible to membership in the American Association, and with the prestige and advantages that such an affiliation affords, it is surprising that at least a large proportion of them do not avail themselves of this opportunity. It should be the duty of every member of the Association to approach his eligible colleagues and point out to them the advisability of becoming members. With such concerted efforts it would not be at all difficult to bring our membership, which last year rose to over 1,400 to at least 2,000 at the meeting in 1913.

In order to reach all those who may desire to join the Association it would probably be best for each state association to appoint a committee on A.V.M.A. Affairs, as has been done by the California State Veterinary Association. Secretary Marshall or I will gladly supply such committees with membership blanks, and they could be sent out by the committee to all who are eligible to membership. The applications of those who desire to become members could then be approved by the President and Secretary of the state organization, which is now required by the rules of the American Association. This ruling will necessarily increase the membership of state associations as applicants must be members in good standing in their respective state organizations in order to obtain the required endorsement of the above-mentioned officials. In consequence the state associations should reciprocate by assisting in the procurement of eligible members for the general body.

The approved applications should afterwards be handed to the Resident State Secretary of the A.V.M.A. for transmission to Secretary Marshall.

Yours fraternally,
JOHN R. MOHLER, President, A.V.M.A.

KANSAS CITY, MO., Oct. 17, 1912.

Editor AMERICAN VETERINARY REVIEW, NEW YORK:

Your letter of the 15th inst. received and contents noted with care. It is possible that I may be able to give you some further light on the subject of the horse plague which prevailed in our section of the country during August, September and the first part of October. I made four different trips to the field and spent about sixteen days investigating the disease, during which time I saw some 400 cases and autopsied about 40.

Briefly, this condition was primarily confined to animals that were in pastures. It seemed to make little difference whether the pastures were high lands or low lands, whether they had stagnant water in them or whether the water supply was from deep wells. This one common factor naturally led one to think that the source of the disturbance was in the pasture and the only one factor that was common in the pastures was the food stuff, so it seemed probable that the food stuff contained the cause of the disease. Animals kept in the territory where the disease abounded and fed on dry feed were universially exempt from the disease.

The disease was attributed by some to intestinal parasites, of which strongylidae representatives predominated. There is not, I believe, any doubt but what some of these diseased animals were depressed with the large number of parasites they harbored, but in view of the fact that some of these animals contracted the disease and died and none of the parasites could be demonstrated on autopsy, it is sufficient proof that the disease was not caused primarily by parasites. The disease was thought to be influenza by some. This diagnosis I suspect was arrived at in part because of the fact that a considerable percentage of affected animals had paralysis of the pharynix and were medicated, the medicaments passing into the lung and establishing medicamentous pneumonia. Still others claimed that the disease was infectious, some holding that the gram positive diplococcus, which could be isolated from a large percentage of the cases, was responsible for the trouble, others claiming that the infection was due to a filterable virus.

Up to the present time no absolute proof has been established as to the exact cause of the condition, but if the disease was due to infection, it behaved materially different than any ordinary infection with which we are familiar. Scores of instances could be recited where diseased animals were taken into barns or yards, where they remained through the entire course of disease or until they died and in the continuous presence of millions of flies, which were a veritable pest in the section of the country where this disease abounded. Further, in many instances, horses were watered out of the same tanks and fed out of the same feed boxes that were used by horses that never contracted the disease. One instance was very striking: On the Missouri Pacific Railroad right-of-way, between McCracken and Utica, Kans., some 78 teams were worked in grading the roadbed. These horses were fed at wagons on the right-of-way, fed dry food and in one instance 24 teams were watered at a tank from which three horses drank that died of the disease and further these three horses died within 10

rods of the above said camp, but not a single horse of the 48 contracted the disease. None of these 78 teams had the disease, except two that were allowed to graze. In another instance, about eight head of horses were transferred from a pasture where the horses were dying of the disease to another pasture containing several horses and in which the disease had not made its appearance. At the same time about six horses were transferred from the non-infected pasture to the infected pasture. Later, the exact length of time I am unable to give, several of the eight horses that were transferred to the non-infected pasture contracted the disease and died. Also some of the horses that were transferred from the pasture in which the disease had not occurred, contracted the disease after being placed in the pasture where the disease prevailed. So far as the information at hand is concerned, none of the animals in the non-infected pasture died of the disease, excepting those transferred from the first pasture. Several blood inoculations, also several intra cerebral inoculations were carried out, but without producing the disease in a single instance. Of course this is not absolute proof that the disease is not infectious, but it indicates strongly that it is probably not infectious.

The symptoms of the affected animals were those that are ordinarily observed in so-called sleepy staggers. Usually the first evidence of any abnormal condition was due to inappetence, or uncertain gait, however the primary symptom which occurred in animals prior to the time that any outward disturbance was shown, consisted in a rise of temperature, the temperature ranging from 104 to 107. This high temperature persisted for only a short time, usually from 12 to 24 hours, after which it usually ranged at about 103. Exceptions to this temperature of course would be evident in cases complicated with pneumonia. A little later the animals in a considerable percentage of cases showed difficulty in deglution. The lack of co-ordination became more and more marked, the animals in some instances leaning against barns, fences, etc., finally losing their balance and falling to the ground, after which they usually remained in a decubital position until death, which resulted in from 24 hours to as much as seven days after the onset.

Later in the outbreak the cases were mild, many of them never losing control of locomotion and regaining health in a period varying from three days to three weeks.

In the autopsy one was particularly struck with the general absence of any constant lesion, excepting apparent venous congestion of the pia mater, which frequently resulted in an edema of

the meninges and brain. In some instances the case was complicated by pneumonia, gastritis, enteritis and nephritis, but upon obtaining the history of these cases, such lesions could invariably be traced to drugs that had been administered, such as croton oil, turpentine, ammonia fumes, etc.

Upon close inspection of the cerebro spinal fluid it was found to be clear, but contained many cells that indicated an inflammatory disturbance. Likewise an examination of the brain tissue at least, in some instances, showed evidence of a small round cell infiltrated into the peri vascular lymph spaces.

The extent of the losses from this disease I believe has been exaggerated. In the territory where the disease was most prevalent it appears that less than 40 per cent. of the horse population died. In other sections the percentage of loss was insignificant. The press apparently did injustice by their startling statements, likewise some drug houses did an injustice by rushing to the scene of action all kinds of drugs, regardless of the fact of their curative value. The people in Kansas particularly were almost panic stricken, due largely to the press notices and to the fact that different diagnoses had been given out by different investigators and they were utterly at a loss to know what to do under the circumstances.

Practically no new cases are now developing, at least in Kanses, the disease having apparently run its course, which I believe can be explained by the fact that the causative agent has been altered through heavy frosts. It is apparent to the conservative obsever that this disease belongs to that class that we ordinarily term forage poisoning.

Very truly yours,

A. T. Kinsley.

Horse Plague in New York—Secretary MacKellar advises us that Dr. Louis Griessman, veterinarian to the Department of Health in Greater New York, will present a paper to the Veterinary Medical Association of New York City at its November meeting (first Wednesday evening in November) entitled "New York's Equine Plague." It is less difficult to imagine what disease Dr. Griessman is going to talk about, than what solution he is going to offer for its control and eradication that has not already been wrestled with many, many times. His colleagues will therefore look forward with great interest to his solution of the problem.

BIBLIOGRAPHY.

SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DISEASES OF DOMESTIC ANIMALS.

SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DISEASES OF DOMESTIC ANIMALS, by Dr. Franz Hutyra, Professor of Infectious Diseases, and Dr. Josef Marek, Professor of Special Pathology and Therapy; both of the Royal Veterinary College at Budapest. Authorized American Edition from the Third Revised and Enlarged German Edition. Edited by John R. Mohler, V.M.D., Chief of Pathological Division, U. S. Bureau of Animal Industry, and Adolph Eichhorn, D.V.S., Senior Bacteriologist, Pathological Division, U. S. Bureau of Animal Industry, Washington, D. C. Volume I., Infectious Diseases; Diseases of the Blood and of the Hematopoietic Organs; Diseases of Metabolism, of the Spleen, Urinary and Circulatory Organs. Over 1,100 pages, 198 illustrations, and 10 plates. 1912, Chicago, Alexander Eger.

This excellent work, fresh from the press, has just found its way to our desk, and, before opening its covers, we are deeply impressed by its magnificent appearance, and on perusing its contents we are able to understand the enthusiasm that has been expressed by German veterinarians in regard to this work during the past two or three years. The chapters on Malta fever, Leukemia of chickens, Dochmias's and Oesophagostomiasis, Enzootic Cretinism in animals, serum diseases and Necrobacillosis; Hemorrhagic Septicemia of sheep, Diphtheria and Contagious Epithelioma of fowels, Scurvy, Coccidial Dysentery of cattle, Enzootic Paralysis of the spinal coard in horses, Paralysis of the bladder and the Psychoses have all been rewritten and brought up to date in the third German edition of this great work, from which the American edition is translated. Essential changes were also made in the chapters on Specific Paratuberculosis Enteritis of cattle. the parasitic diseases and skin diseases; also in the therapeutic portions of most chapers, and when we stop to consider that this work is recognized as the most comprehensive and authorative treatise on the theory and practice of veterinary medicine in Germany, Austria and Hungary, and has been adopted as a textbook by all the veterinary colleges in those countries as well as in Switzerland, and that its translation into the English has been done by such American veterinarians as Mohler, Eichhorn and Fischer, its excellence as an American textbook on pathology and therapeutics, is not difficult to imagine.

Infectious Diseases are divided into six groups as follows:

Group I., *Acute General Infectious Diseases*, of which thirteen are described. Group II., *Acute Exanthematous Infectious Diseases*, of which four are described. Group III., *Acute Infectious Diseases with Localization in Certain Organs*, of which five are described. Group IV., *Infectious Diseases with Special Involvement of the Nervous System*, of which two are described. Group V., *Chronic Infectious Diseases*, of which eleven are described, and Group VI., *Infectious Diseases Produced by Protozoa*, of which three are described.

Following these are *Diseases of the Blood and Blood-Producing Organs, Diseases of the Spleen, Diseases of Metabolism, Diseases of the Urinary Organs, and Diseases of the Circulatory Organs.* The descriptions of the diseases are clear and complete, yet brevity is a marked feature of the work. Considerable space is given to glanders, however, and the newer tests are accurately described and strikingly illustrated, largely in colors. The colored plates illustrating nasal and cutaneous glanders, the conjunctival opthalmo reaction and the complement fixations test are excellent. Another very striking colored plate is that illustrating infectious vaginal catarrh of cattle, showing nodules on the swollen and reddened mucosa of the vagina of a cow. Practitioners of veterinary medicine will find in Hutyra and Marek's *Pathology and Therapeutics of the Diseases of Domestic Animals*, a safe, comprehensive and authorative textbook on veterinary medicine; right up to the very hour; and English speaking veterinarians are to be congratulated on having an English translation of this superior German work at their command. Other countries have recognized its great value, as it has recently been published in Italian, and a Russian edition is being prepared. The publisher of the American edition deserves great credit for the superior manner in which he has executed his work; giving to the volume a finish and elegance in keeping with its merit. Printed on good paper, the type is clean and sharp, making reading easy and pleasant. We predict the popularity of this work with American veterinarians, equal to that in Germany.

VETERINARIAN'S HANDBOOK OF MATERIA MEDICA AND THERAPEUTICS.

VETERINARIANS' HANDBOOK OF MATERIA MEDICA AND THERAPEUTICS, by D. H. Udall, B.S.A., D.V.M., Professor of Veterinary Medicine and Hygiene, New York State Veterinary College, at Cornell University, Ithaca, N. Y. 1912. Carpenter & Co., Ithaca, N. Y.

This book, in pocket form, contains information which the veterinarian needs daily yet does not always have at his " tongue's

end." It might be called a ready reference book and compares very favorably with the German Veterinary Calendar. Bound in black flexible leather covers and printed on excellent paper the book presents a very neat appearance.

Tables of the different weights and measures with their equivalents in the Metric system are given first, followed by tables of solubilities: how much of a drug is necessary to make a given solution as 1-500 or 0.2 per cent. and also how much is needed to make a saturated solution either in water or alcohol. A few representative formulas and a brief description of the more important drugs in alphabetical order with their ordinary uses and doses make up Parts 3 and 4. It is worthy of mention that the Latin name and termination as well as the common name of each drug is given. For example, " Argenti Nitras Fusus (Lunar Caustic), 94.8 per cent. $AgNo_3$ in cones and pencils; Exteru., caustic on unhealthy granulations, ulcers, etc."

In Part 5, Treatment of Diseases, the more common ailments of our domesticated animals are considered with the latest therapeutic indications. Much very valuable information is here collected in small space. It might appear on casual examination to be too brief, but where names of drugs are mentioned details as regards their use are found in Part 3. Symptoms and Treatment of Poisoning and the Administration of Medicines, per os, rectal, intravenous, etc., make up Parts 6 and 7. Obstetrical tables as period of estrum, duration of pregnancy and parturition followed by methods of determining the age of domestic animals and tables of equivalents of Centigrade and Fahrenheit Thermometric scales are included in Part 8. Veterinary Hygiene, Stable Construction and Disinfection, Physical Examination of Animals with Scheme and the Shipment of Tissues for Laboratory Diagnosis are discussed in Parts 9, 10 and 11.

The method of presentation of the subject matter is admirable. It is very concise, a necessity in a book of this kind that endeavors to place in pocket form information which in many cases is contained only in large volumes. The best authors of this country and Europe have been freely consulted and the latest knowledge in veterinary practice is given. It is a book which appeals especially to the practitioner in the field who does not always have a library to consult.

International Live Stock Exposition, Chicago, November 30 to December 7, 1912.

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular monthly meeting of this association was called to order by Dr. H. D. Gill, acting as temporary chairman, until the arrival of Dr. Berns.

The minutes of the June meeting were read and approved.

Dr. W. J. McKinney, chairman of the Prosecution Committee, reported that charges of practicing illegally had been preferred against an Italian blacksmith in Brooklyn The committee retained counsel, but before the case came to trial the defendant left the country. This report on motion was unanimously accepted.

The reports of the degelates to the N. Y. State and the A.V.M.A. meetings were next in order.

Dr. W. Reid Blair gave an interesting report of the state meeting and stated that he considered it one of the most successful ever held.

Dr. Berns stated that the clinic was a great success in the number and variety of operations and the abundance of clinical material.

Dr. McKinney also made an interesting report on the clinical features of the meeting, especially the operation of ligating the saphena vein above the hock with the object of reducing so-called blood and bog spavins. He stated that he personally had some remarkably good results from this simple operation.

Dr. De Vine reported that he had performed this operation recently and with indications of good results.

Dr. Duncan (M.D.), stated that this condition of the hock was undoubtedly similar to the varicose limbs met with in the human subject.

Dr. Schlesinger mentioned a case in which he had ligated the vein, and then punctured the blood spavin. A good deal of hæmorrhage resulted, which complicated matters for a time, but great improvement finally resulted.

Dr. D. W. Cochran, president elect of the New York State Veterinary Medical Society, gave an interesting account of the A.V.M.A. meeting at Indianapolis.

Dr. R. W. Ellis also gave a very concise report of this meeting and referred the members to the AMERICAN VETERINARY REVIEW for the complete report.

Dr. Ellis then made an interesting case report of a female cocker spaniel which was brought to his office for treatment.

This dog at first sight, appeared to be heavy in pregnancy, but when examined it was found that this was not the case.

A large tumorous mass was diagnosed, and the destruction of the animal recommended. This was done, and on opening the abdomen a large mass almost rolled out, having very slight attachments.

Dr. Thos. F. Kililea (M.D.), a personal friend of Dr. Ellis, who is very much interested in specimens of this nature, made the following report on the microscopical and histological findings of this specimen:

Macroscopically the tumor was a large spherical mass weighing more than ten pounds, and apparently fibroid in character, showing at various places in the growth distinct degenerative changes, apparently colloid in character.

Microscopically the tumor consists of ovarian tissue undergoing colloidal degeneration. The colloidal areas present a structureless, semi-solid substance of mobile pathological material resembling glue in appearance and consistency, jelly like, firmer than mucous, and differing in its reaction from albumin.

This degeneration much resembles the mucoid degeneration.

The disorganized material becoming structureless, semi-solid, jelly or glue like in appearance. The fibrous portion presents the usual character of fibroma.

Though fibrous in appearance the structure cannot be separated into fibres. Here we have the substitution of the fibrous for the higher grade of tissue. By tissue is meant the "aggregate of cells which obeys the law of growth."

The degeneration in the fibrous tissue much resembles the degeneration incident to senility. We find (in the specimen) the fibres degenerated in bundles or systems in contra-distinction to the insular or scattered degeneration.

The discoloration is not due to melanosis, but to the preserving agent used.

Diagnosis—The subject was of advanced age, carrying a degenerated ovarian tumor.

Prognosis—The neoplasm is malignant, and the rapid growth and degeneration would soon bring about dissolution.

Dr. Kililea exhibited this tumor, and further sections of the

same were made which showed very plainly the large extent of the jelly like colloid degeneration.

The Doctor also cited an interesting case in a human subject, which was somewhat similar to this dog case. This subject was operated on successfully.

A hearty vote of thanks was extended to Drs. Kililea and Ellis.

Dr. John A. McLaughlin then read a paper entitled "A New Field for Aetiological Research Opened by Schmidt's Treatment of Milk Fever." A new theory of azoturia in the horse.

This paper was productive of a very animated discussion by the members and visitors present.

The Doctor in this article asked the question, viz., what is the condition that is cured by the injection into the udder of iodide of potash solution, oxygen, air or even solutions of filthy material as any and all of these agents will abate the symptoms of parturient apoplexy even if other complications may follow the use of septic material.

These conditions were discussed by Drs. McKinney, De Vine, Schlesinger, Chase, Ellis and others.

Dr. Mangan cited a case of azoturia which was treated on the order of auto therapy. The urine was drawn off and collected, and an ounce of the same given the animal every hour until late at night. When the attending veterinarian called the next morning the horse was on his feet, and made a good recovery.

Drs. Kililea and Duncan expressed themselves as very much interested in the theory advanced by Dr. McLaughlin, and said that they would give it serious consideration in relation to cases of a similar character in the human subject.

Dr. Berns suggested that the discussion of this subject be continued at the next meeting.

A vote of thanks was tendered Dr. McLaughlin.

Meeting adjourned.

R. S. MacKellar, Secretary.

NORTH DAKOTA VETERINARY MEDICAL ASSOCIATION.

This association held its first summer meeting at the Agricultural College, Fargo, N. D., July 23, 24, 25, 1912, with the largest attendance in the history of the association.

Among the visitors at this meeting were two gentlemen from

the foremost ranks of our profession in this country, viz., Dr. J. W. Adams, of Philadelphia, and Dr. C. E. Cotton, of Minneapolis.

The two principal features of this meeting were. "A Demonstration of the Surgical Operation for the Relief of Roaring," preceded by an explanatory talk on the subject by Dr. Adams; and a "Demonstration of the Types of Live Stock Best Suited to North Dakota Conditions," by Prof. W. L. Richards of the faculty of the North Dakota Agricultural College.

Both features were thoroughly enjoyed by the association.

The usual banquet was held at the Comstock Hotel, Moorhead, where plates were laid for more than fifty members, their wives and visitors. After the banquet Dr. Cotton favored the association with a few remarks in his usual happy vein. "Come again, Doctor Cotton!" A rising vote of thanks was extended to Dr. J. W. Adams for the able manner in which he presented his subject before the association.

Six new members were elected at this meeting, as follows: Drs. R. W. Bernhardt, J. A. Logan, J. B. Thompson, H. M. Eisenlohr, C. T. McPike and P. E. Nulph.

The convention adjourned at noon, Thursday, July 25, to meet at Fargo, N. D., January 22, 23, 1913.

C. H. Babcock, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of the Keystone Veterinary Medical Association was held October 8, 1912, at Donaldson's Hall, Philadelphia, Pa

The seating of the officers for the ensuing year, who were elected at the September meeting was the first thing on the program, viz.:

President, Dr. E. K. Yunker.

Vice-President, Dr. W. G. White.

Secretary-Treasurer, Dr. C. M. Hoskins.

Board of Censors, Drs. W. H. Hoskins, Cox, Marshall, Klein, Rhoads.

The program of the evening was a talk by Dr. John W. Adams on "Street Nails." This was followed by the report of several unusual cases by the Drs. Hoskins one of "Gangrene of the Tongue" of a dog, and another of a "Proliferative Ballonitis" in a dog.

Cheston M. Hoskins, Secretary.

MONTANA VETERINARY MEDICAL ASSOCIATION.

The above association met in annual session in the office of Dr. M. E. Knowles, State Veterinarian, Capitol building, Helena, Mont., September 23 and 24, 1912. The meeting was opened by the address of the president, Dr. W. J. Taylor, and followed by several very interesting papers and discussions.

The association voted to again support a bill in the next legislature to regulate the practice of veterinary medicine in Montana.

Appropriate resolutions of sympathy were passed upon the deaths of Dr. Robertson Muir and Dr. T. Earl Budd.

The following officers were elected for the ensuing year: President, Dr. W. C. Orr, Dillon; Vice-President, Dr. Howard Welch, Bozeman; Secretary-Treasurer, Dr. A. D. Knowles, Livingston.

The mid-winter meeting of the association will be held at Bozeman, in January, 1913.

A. D. KNOWLES, Secretary-Treasurer.

SOCIETY OF COMPARATIVE MEDICINE, N. Y. STATE VETERINARY COLLEGE.

The first meeting of this society was held in the college auditorium October 4, 1912. The meeting was called to order by the president. After the roll call the constitution and by-laws were read for the benefit of the new members. The Dean of the college, V. A. Moore, then gave a very interesting talk on the object of the society. A warm discussion on athletics followed, after which the meeting adjourned to a social evening. Refreshments were served and music delivered by the orchestra about which the fellows gathered and enjoyed the evening in singing popular songs.

D. W. C., Corresponding Secretary.

ABSTRACT FROM ADDRESS OF PRESIDENT E. J. WALSH DELIVERED BEFORE THE NORTH DAKOTA VETERINARY MEDICAL ASSOCIATION.

At the mid-summer meeting of the North Dakota Veterinary Medical Association, which is reported by Secretary Babcock on page 243 of this issue, President Walsh gave an address of unusual interest and value. He started by saying, "birds of one feather flock together"; and explained that the flocking together of our fellows, has much more in it than the mere satisfaction of seeing each other, they are impelled by the necessity of caring for common interests, which can only be safeguarded by united ef-

forts. This, he says, is probably the cause of associations like theirs having come into existence. And yet he fully appreciates the social side, as he says, "in all that pertains to human life and effort, man's social or gregarious nature, is apt to assert itself. In him the need of meeting his fellows, is a deeply-rooted racial trait; and this feature is especially well marked among those who face the same problems, and whose ups and downs are in a large measure identical." He believes that the veterinarian is no exception to the general rule, and the man who permits himself to be isolated from his brethren, suffers professional degeneration, and sooner or later is apt to become thoroughly dissatisfied with his life's work. The doctor reflects that while we have a right to feel proud of things accomplished in the past, we have got to be awake to the changes that are constantly going on. He directs the attention of his brothers to therapeutics as effected by modern pathology, serum therapy and immunization against contageous diseases; also reminding them that this form of treatment is still in its infancy and has its limitations, and that therefore there is danger of placing *too much* reliance on it, and of accepting the O. K. of the manufacturers of vaccines, etc., as to their value in the treatment and prevention of disease, and to thereby unconsciously fall into the ways of the empiric, and lessen their resourcefulness. That the doctor fully appreciates the great value of serum-therapy there can be no doubt, and that is why he would have his brothers fully understand it, and know the pathology of the diseases they apply it to, and not content themselves to accept it as a specific without giving themselves any further concern; because he can see, as can everyone, that such an attitude does not spell progression; and if there is not progression there must soon be retrogression; an individual like a profession cannot stand still, and as soon as he ceases to think for himself, and reason things out for himself, he must go backward. And so all through his address of more than two thousand words, President Walsh deals with the important matters that concern the veterinary profession today, the necessity of the modern veterinarian becoming familiar with types of live stock and its breeding, clean milk production and all matters relating to sanitary science, in a manner that indicates a careful study of the subjects involved; not yesterday, nor merely for the preparation of the valuable address that he gave to his fellow members in connection with the opening of the association, but all through his professional life—his professional development—and we regret that lack of space will not permit of our publishing it in full at this time.

AMERICAN VETERINARY REVIEW.

DECEMBER, 1912.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, October 15, 1912.

A SUCCESSFUL SURGICAL OPERATION.—In the Bulletins of the Royal Academy of Sciences of Bologna, Prof. A. Baldoin has published the resumé of his successful interference in a case of purulent traumatic arthritis of the temporo-maxillary joint in a horse by the resection of the condyle of the maxillary bone, which I extract from *Leclainche's Review*.

The total resection of the condyle is an operation almost unknown in veterinary surgery—the only case on record is that of Vachetta, who operated in 1883, also for purulent arthritis of the joint. Partial resection of the condyle and complete of the articulation have however been already performed by Frohner, Eberlein and Baldoin. In the present case the entire resection was performed in a four-year-old mare which had purulent arthritis of the temporo-maxillary joint as sequelæ of a punctured wound.

A month after the accident, there was on the left temporo-maxillary joint a round swelling, as big as half an orange, warm, painful, with fibrous consistency and having a solution of continuity in its center, partly closed with granulations. A probe introduced gave the sensation of rough articular surfaces. The masseter muscles, principally the left, are atrophied and the jaws firmly closed, are opened with difficulty. The mastication is very limited, the animal feeds very poorly and is much emaciated.

Rather than try any kind of treatment Baldoin decides to operate at once.

The animal is thrown, and anesthesia being considered not necessary, the region is prepared. "Two perpendicular incisions are made, 6 centimeters long, crossing on the center of the tumefaction. The cutaneous flaps are dissected and kept apart with sharp tenaculum. A second crucial incision is made in the sub-cutaneous tissues, namely, the infiltrated thickened connective tissue, a fibrous layer, the portion of the parotid covering the anterior part of the articulation, the masseter and the capsular ligament reinforced by the external funicular band."

Great care was taken to avoid injuring the parotid, which was raised and held back. The transversal artery and vein of the face which pass below the joint were also carefully drawn downward. "The joint being thus exposed, the soft tissues round the neck of the condyle were isolated with probe and blunt bistouris and the condyle then cut off with shears of Liston, care being taken not to injure the internal maxillary artery nor the nervous trunks of the fifth and seventh pairs. After the section of the neck, the capsular ligament was divided as well as the posterior funicular ligament, and the articular meniscus, already partly necrosed, was cut off and removed." The walls of the articulation and the articular surfaces were curetted, the wound was cleared off and dressed with a plug of gauze and iodoformed glycerine. There was very little hemorrhage. Immediately after the operation, the animal could open his mouth quite well and after five days mastication was normal. The recovery was perfect, except that the left temporo-maxillary joint is less prominent than the right.

* * *

The recovery has necessarily required the formation of a pseudo-arthrosis. To judge of its characters Baldoin performed the similar operation on a subject for experiment. The resection was performed without difficulty and recovery perfect after

forty days. Three months after the horse was killed. On examining the seat of the operation, a mass of connective tissue was found uniting the zygomatic arch to the stump of the neck of the maxillary, adherent to the posterior border of the coronoid process and in continuity with the surrounding tissues. The objections to the operation are rather numerous, but can be easily avoided.

The lesions to the facial nerve are almost impossible in solipeds on account of its low location. It is also impossible to injure the anterior auricular artery and vein or the temporo-zygomatic nerve, which are on the outside of the operating field.

But it may be possible and easy to wound the parotid, the transversal blood-vessels of the face and the superficial temporal nerve. Accidents can be avoided by the dissection of the anterior border of the parotid which is then drawn backward and that of the blood-vessels and nerve which are pushed downward.

The most serious complication is the wound of the internal maxillary artery which runs inside the body of the condyle. Branches of the fifth and seventh pair of nerves may also be injured or again perhaps the guttural pouch in the superior portion. These accidents that are difficult to avoid when the resection is made with chisel and hammer are yet possible with the osteotomic shears. The surest way would probably be to resort to the chain saw, introduced between the neck of the condyle and the internal maxillary artery. For Baldoin the total resection of the condyle is the best operation in all cases of purulent temporo-maxillary arthritis. It is more simple and less dangerous than the complete resection of the joint and besides is followed by a more rapid recovery and a less marked deformation of the region. At any rate it was a grand operation which deserved recording.

* * *

Lactic Ferments In Comparative Pathology.—For some time, in human medicine, the origin and pathogenic action of intestinal fermentations have been well known, and from this

knowledge, so clearly demonstrated by Professor Metchnikoff, a new therapy of intestinal diseases has been started, established on the principle advanced by the professor; viz., substitute to the wild flora of the intestines one of culture of other species, benignant or at least harmless.

In veterinary medicine and present knowledge of intestinal flora are quite complete, as far as the dog is concerned. And although we know less of that of horses, Metchnikoff has recently demonstrated that the intestines of the last animal contain in great quantity poisons of the aromatic series (iodols and phenols) which indicate the rich condition of the toxic flora.

And from these demonstrated facts it seems possible, comparing from man to animals, to admit that the pathogenous action of this flora in animals is quite closely related to the symptoms observed in a very large number of digestive troubles, in which the functions of the apparatus are vitiated by putrefaction, by fermentation, *acute enteritis, intestinal localizations* in infectious diseases, such as in influenza of horses and distemper of dogs or again in chronic cases where the infectious condition plays a prominent part.

Certainly it was interesting to know if, in animals, the neutralization of the toxic elements of the intestinal canal could be obtained with the administration of lactic ferments and the precious results realized in man be, with horses and dogs, similar and as important as they are in man.

There is but one chemical agent which can, without danger, realize intestinal antisepsy and control its fermenting condition; it is lactic acid. And as it has been demonstrated that fermentation can take place only in an alkaline media and that it can be arrested or controlled by lactic ferments which render the media neutral, the indications were evident that lactic ferments must be resorted to so as to realize the permanent acidity of the intestinal media and reduce the fermentation to its minima.

Among the many preparations containing the bacilli-producing lactic acid, the lactobacilline is in very high estimate in human medicine as an agent for intestinal therapy, being made with pure

cultures of bacillus Bulgaris, which by many observers is recognized as an excellent producing agent of lactic acid, and which besides has the property of acclimatizing itself readily in the intestines when in the presence of sugars. With all these points in consideration, experiments were made and recorded in the *Recueil de Medecine Vétérinaric* by Mr. Darrow, veterinarian of the Republican Guard in Paris. In horses 14 cases were treated, 2 for acute muco-membranous enteritis, 7 for chronic affections of the same nature, 2 for repeated colics of indigestion, 3 for intestinal suralimentation, 2 for intestinal localization during an attack of influenza. In dogs, 2 cases of intestinal localization in distemper, 2 for intestinal intoxication with unknown cause, 1 for gastro-enteritis.

The results were in all most satisfactory, principally in chronic cases. Improvement is already observed two or three days after the treatment was begun. The lactobacilline can be given in powder (20 to 30 grammes to horses, 5 to 10 to dogs), mixed in food or electuary. It can also be used in cultures, 2 litres a day for horses, 150 to 200 grammes to dogs. Sugar, molasses, syrup must be administered at the same time.

This new form of treatment for diseases of the digestive canal, which are sometimes so severe, so rebellious and even fatal, deserves at the hands of practitioners a fair trial.

* * *

Vaccinia.—Professor Cadéac has written in the *Journal de Zootechnic* a long review on this subject embracing its etiology and pathogeny and in which many points of interest are at length considered, such as: the theory upon the pathogenous agent, the virulent matters of the subjects affected with it, the resistance of the virus, the variation of its virulency, the vaccinal immunity it posesses, the serotherapy of vaccine, its relations with variola, the artificial infection, the pathogeny, the secondary infection, and the vaccination.

This long enumeration of the various parts treated by the

professor tells how complete his review is, and prevents an entire reproduction. I will, however, offer our readers one of them as being probably of a specific interest and because it contains information with which they may not be very familiar.

* * *

Artificial Infections.—Horses are the animals that have the maximum of receptivity for vaccinia. The inoculated vesico-pustules of the horse may appear quite often outside the points of inoculation; they contain abundant and very active lymph.

Subcutaneous injections of the vaccine is sometimes followed with large pustular exanthemas which by their seat and characteristic together do not in the least differ from the eruption of natural horse-pox.

The generalization of the consecutive infection of a local inoculation is specially characteristic to the *horse,* showing as it does the extreme receptivity of this animal species. The horse appears to us as the primitive source of vaccinia; he is easily infected by all ways. *Ingestion* of vaccinal pulp and the *inhalation* of dried or pulverized vaccine is followed sometimes by generalized eruption.

The introduction of vaccine in veins promotes quite frequently in *horses* the eruption of vaccinal exanthemas, exact fac-similes of those of the natural disease. Sometimes, however, the eruption is vesicular or vesico-populous, like that which succeeds to the inoculation of variolic virus in veins. The absorption of the virus through lymphatics is followed, after eight or ten days, with an eruption identical to that which results from natural infection. The deposit of virus on a wound, a cutaneous excoriation or that of a mucous, is like a local inoculation, the preface of the apparition of one or several pustules.

Infection in the *testicle* gives to the pulp of that organ a vaccinal activity noticed from the third to the seventh day.

Donkeys offer to vaccine a receptivity nearly equal to that of horses. The *ass-pox* has often been observed.

Bovines are a little less susceptible than *equines,* in this way, that eruption does not generalize.

The pustules of the *cow-pox* follow the cutaneous inoculation of the natural or artificial cow-pox, of the horse-pox or of the human vaccine (retro-vaccination). As many vesico-pustules as there have been inoculations made will appear and all are umbilicated. The subcutaneous injection of vaccine gives rise to an oedematous infiltration without any eruption. The injection of vaccinal lymph in the galactophorous canals is followed after two or three days by a moderated fever, swelling and painful teats; the milk becomes purulent and bloody toward the ninth day; it is virulent the fourteenth; the local pain is due to the development of vesicles on the walls of the galactophorus canals. Young animals are considered as having a greater receptivity than adults, but it has not been proved why. The venous injection of vaccine does not give rise in the calf to general accidents. Indigenous heifers of Soudan are not very sensitive; but *buffaloes* in Saigon are.

Sheep contract the *sheep-pox* vaccinia by inoculation, but they are not very good media; appearance of the pustules is slow and they remain small, assume a populous form and often dry before the secretion takes place.

Goats take the *goat-pox* by inoculation; they are excellent vacciniferous; the pustules have all the characters of the classic vaccine.

Lama contract vaccine; the eruption is slow. The transmission from *lama to lama* reduces the virulency of the infectious agent.

Camels are excellent vacciniferous animals.

Swine are an uncertain media of culture.

Dogs take vaccinia easily, whether human or animal. Subcutaneous or intravenous injections give immunity without eruption appearing.

Rabbits are also susceptible to vaccinia. They have typical pustules with hyperlukocytosis between the third and fifth day. The best way to inoculate is to apply fresh or glycerined vaccinal pulp on the skin just when it has been shaved, and is yet irritated by the shaving.

The vaccine, not very virulent, is inactive when inoculated in

the skin, but it cultivates on the cornea. Receptivity in rabbits varies.

Guinea-pigs are very susceptible; its immunity is temporary.

Chickens take vaccinia by inoculation of the skin of the thorax or that of the gills. The lesions consist in papulo-pustules transmissible in serum from one chicken to another.

Monkeys are also susceptible and can be used as animals for experiment.

Man has less receptivity than horses and bovines; epidemics of vaccinia are unknown in human species and accidental inoculations are also rare.

* * *

Important Question in Breeding.—At one of the last meetings of the National Agricultural Society Mr. G. Barrier, the Inspector of the Veterinary Schools of France, presented a valuable paper upon the importance of the general improvements in breeding by the qualities that a mare ought to possess before being selected as a brood mare. The several articles which have appeared in the Review and as an addition to the suggestions made by some of our correspondents, Dr. Schwartzkopf, among the first, justify me in sending the resumé of Mr. Barrier's communication.

"1. In the sexual act, the mare gives out a germ which unites its hereditary energies to those of the stallion's germs. She offers, besides, to the fecundated egg a shelter where it will gather all the materials for its first development, almost always the director of the ultimate growth.

"2. The ovule or female germ, possesses in power all the morphology, the energy and the heredity of the mother; the spermatozoid, or the male germ, those of the father. The uniformity between the two germs sums up their properties, which unite in the product; their unevenness promotes their concurrence and has on the contrary a tendency to separate them.

"3. With equal hereditary power, the mother thus, in the

creation of the product and in consequence for the improvement of the breed, is as good as the father.

" 4. The hereditary power is closely related to the ancientness of the breed or of the family and at the same time to the racing aptitudes of each of the generators.

" 5. It is then as indispensable to take in careful consideration the origin and the racing aptitudes of the brood mare as those of the stallion, if one wishes to reckon on the value of her ancestral and her individual heredity.

" 6. If the two generators are well conformed and belong to the same breed, the product will benefit of the morphology and of the energy of both, but nearer to the one which will have an individual preponderating heredity. In such case the maternal influence then always comes to attenuate or increase that of the father; hence the necessity to select the mother as strictly as possible, in the sense of the characteristics best adapted to the breed. And besides she must be ample, compactly built, robust and healthy, as long as it models and feeds the product.

" 7. If the generators, always well confirmed, are of different breeds, the product will not participate of their morphology and their energy, only if there is between them affinity of forms, of moticity and of the analogous exigencies of climate, soil, raising and care; in the contrary case, the separation of the characters of the two breeds will appear in the product and the process of the raising will increase.

" Unlikeness of the generators is one of the most dangerous risks of a crossed product.

" 8. If (which is frequent) the brood mare does not belong to a breed well confirmed, the uncertainty of the hereditary transmission is then carried to the extreme, the value of the product is altogether problematic.

" The operation will soon become disastrous, as by forcing to the highest degree the separation of the characters, it increases the failures of the production and hence the miscalculations and losses.

" 9. The impregnation of the mother by a first gestation, the

tetagony, does not rest on observations or indisputable experiments, but only on facts of *superfetation* or of *atavism.*

"In the present state of science it can not be considered as proved. On the contrary, everything seems to show that the first copulation has no more influence than the others and that it only affects the present and not the future of the mare.

"10. Theoretically, the breeding of horses would lose less if the idea that the stallion is all and the mare only a simple recipient for the semen to fructify, was not so firmly taken in consideration."

The importance of the above remarks will not escape veterinarians who practice in breeding districts where their good advice on the subject can but help to raise the importance and standing of their profession.

* * *

Bibliography.—I have received from Publishers Carpenter & Company, of Ithaca, N. Y., a new book from Dr. V. A. Moore, the learned director of the New York State Veterinary College. The work's title is Principles of Microbiology and is a treatise on bacteria, fungi and protozoa pathogenic for domestic animals. The author who holds the important chair of comparative pathology, bacteriology and meat inspection has dedicated his work to all the students who have been studying in his laboratory, and have stimulated him in bringing it out for the needs of beginners in the study of microbiology.

It is often said for new books coming out that they are just making their appearance at the proper time and that they will fill a wanted need. Certainly the same remark will apply to Principles of Microbiology and if veterinary students of Professor Moore will benefit, there can be no doubt that any one who will follow this special study will learn much in reading it. It is not a large book, it is not one that goes into the entire subject of microbiology, but yet see how plain its value is presented in the preface. "Its purpose is to point out the place and role

of micro-organism in nature, to give the methods for their study and identification, to indicate the relation of certain species to animal diseases, to give a description of the more important species pathogenic for animals and a brief discussion of the reaction of the tissues to microbian invasion and the theories of immunity."

And yet the author says the work is not exhaustive, he might have added that it contains *ALL* the essential and important elements which without them the student would find himself much embarrassed.

The volume is made of nearly 500 pages, it has 101 illustrations, well gotten up, easy reading and its contents are divided into 25 chapters where, after a historical sketch and numerous generalities, including the place in nature of bacteria, their morphology, classification and identification of species, the bacteriological apparatus, preparation for cultivation, examination of cultures, stains and so forth, the reader is brought to the consideration of Chapter XV and XVI, which treat of the coccaceæ and their genders, stryptococcus and micrococcus. In the four following chapters we read of the bacteriaceæ with the bacillus, the bacterium, the germs pseudomonas migula and the higher bacteria and fungi pathogenic for animals. Protozoa and their pathogenic species, the diseases due to filterable viruses, the consideration of bacterial products, tissue reactions and immunity bring the reader to the end by a glance to serum diagnosis and one to immunity and vaccine therapy.

By this concise enumeration of the contents of Principles of Microbiology one can readily judge that Professor Moore has done a good work and that all those, students or practitioners, who will study them will open for them the doors to a most fascinating and important branch of medicine.

* * *

Bibliographic Acknowledgments.—*The "Braxy" Type of Sheep Disease in Australia,* by Professor Gilruth, D.V.S., M.R.C.V.S., of Melbourne University. A reprint from the

"Australasian Association for the Advancement of Science," where the author gives a detailed account of his investigations, experiments, etc., etc., relating to the presence, causes, symptoms and pathogeny of "a group of diseases of sheep which exists in various parts of the world, which though not absolutely identical are so closely allied that they may be dealt with under one general term 'Braxy,' the old-established British name."

From the Bureau of Agriculture of the Government of the Philippine Islands, under the direction of Archibald R. Ward, B.S.A., D.V.M., Chief Veterinarian, I have received Bulletin No. 20, *Experiments on the Efficiency of Antirinderpest Serum,* by the Chief and the Acting Assistant, Frederick William Wood, D.V.M., with the general conclusions: "The foregoing experiments seem to show that antirinderpest serum does not prevent infection with rinderpest. On the contrary, animals injected with serum and exposed to rinderpest soon contract the disease and pass through a more or less modified attack. We have shown that the blood of animals is infective during the attack. If by passive immunity is meant an artificial condition by means of which the severity of an attack is lessened, we grant that such exists, but deny that there is a passive immunity of a kind that prevents invasion by the virus of rinderpest."

Bulletin No. 20, *Notes on the Muscular Changes Brought About By Intermuscular Injection of Calves with the Virus of Contagious Pleuro-Pneumonia,* by Dr. William Hutchings Baynton, D.V.M., pathologist, under the direction of the Chief Veterinarian, with four illustrations.

Bulletin No. 21, *Study of the Normal Blood of Carabao,* by the same authors, researches made at the veterinary laboratory.

Alpha Psi Directory, complied by H. Preston Hoskins, V.M. D., of St. Paul, Minn. This is the first edition which had its issue retarded because of the difficulties to obtain all the information needed, and it is only by hard work that the present National Secretary of the Council, Dr. Hoskins, has succeeded in getting the work in proper shape for publication.

The officers of the Council of the *Alpha Psi Fraternity* thank

all those who have assisted in compiling the necessary material for this edition, but certainly they deserve themselves great compliments for having brought before the members of the Society the interesting contents before us. Already a number of Chapters are in working order, and many familiar names we can find in the Alpha, Beta, Gamma, Delta, Epsilon.

Founded by the veterinary students of Ohio State University in 1906 in order to promote a stronger bond between the veterinary colleges of North America, it counts already 747 members, 120 honorary, 370 graduates, 237 active, represented in Chapters named by the eight first letters of the Greek alphabet.

As the profession will grow older in North America, so will the Alphi Psi fraternity grow bigger and with it greater intimacy among veterinarians and their Alma Mater.

A. L.

SILVER ANNIVERSARY OF IOWA VETERINARY ASSOCIATION AND REUNION AT AMES.

November 12, 1912, marked the opening of the first session of the twenty-fifth annual meeting of the Iowa Veterinary Association, which was in the form of a jubilee, in celebration of the silver anniversary of the association, which was organized in Ames in 1887, and of the opening of the splendid new buildings of the old veterinary school of Iowa State College. It was a great triumph for this pioneer veterinary school of the West (the foundation of which was laid by Professor Stalker in 1878) to be in a position to take care of the silver anniversary meeting of the powerful veterinary organization of which Iowa boasts; and it was an equally great triumph for the veterinarians of Iowa to find such a splendidly equipped veterinary school in the state of which they are justly proud, the "Hawkeye State," their own fertile Iowa. And, to add to the jubilee spirit, it was also "home week," and as the week advanced alumni from the various schools of the institution other than the veterinary school began arriving on the campus, in anticipation of the football game that was to

be played on the closing day of the week between the "Cyclones" of the Iowa State College and the "Hawkeyes" of the Iowa State University on the campus of the former institution. It was under these auspicious conditions that the Iowa Veterinary Association opened the first session of its silver anniversary meeting, and was welcomed to the city by the citizens of Ames through Mr. J. Y. Luke, of the Commercial Club, who gave the

International Champion Pen of Barrows, Ames, 1911.

members of the association and their guests a very cordial welcome indeed and some encouraging advice. President Raymond A. Pearson being unavoidably absent, attending a conference of agricultural college presidents, at Atlanta, Ga., Dean Edgar Williams Stanton of the Division of Science, who has given nearly half a century of his lifetime to the Iowa State College and whose enthusiasm is only equaled by his love for the college (the Veterinary school occupies a large and a warm corner in his heart) welcomed the association to the college and told its mem-

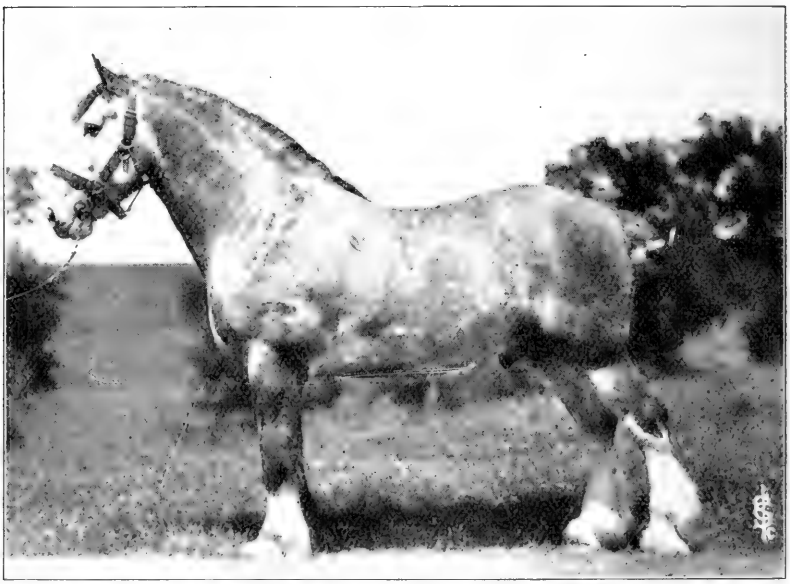
bers he wanted them to feel that it was their own, to come into whenever they desired and to use it for their own benefits in any way that they could. To those whose great privilege it has been to meet that whole-souled gentleman, Dean Stanton, the heartiness of the welcome and the warmth it brought into the hearts of those to whom it was given will be readily appreciated, as it seemed to be by Dr. S. H. Johnston, Mayor of *his* home town,

Victor—International Grand Champion, Ames, 1911.

who responded for the association in a humorous manner. The rest of the day was given up to the reports of some very important committees, and the reading and discussion of a paper on "Serum Therapy by the Simultaneous Method for Hog Cholera,"* by Dr. E. A. Buxton, of Vinton, Iowa. The discussion of this very interesting paper on a subject, the importance of which may be imagined when we remember that the author of the paper stated that the loss to farmers in the state of Iowa

*Publisned on page 331 of this issue.

from this plague during the past year was about fifteen million dollars, was opened by no less an authority than Dr. W. B. Niles, of Ames, who, with Dr. Dorsett, produced the Dorset-Niles hog cholera serum known to the profession on both sides of the Atlantic. The discussion soon became general, in which the members manifested unusual interest and seemed about equally divided in their opinions as the better results from the simultaneous method and that in which the serum alone was used. State Veterinarian



International Winner Used in Government Horse Breeding Work at Ames.

Gibson favored the "serum only" method, and expressed it as his opinion that where it failed it was due to the presence of pleuro-pneumonia in addition to hog cholera, in which case he believed that no treatment would avail. He advised the veterinarians to be careful and methodical in work of that kind, to use enough serum and not try to do so many in a day that they could not attend to the necessary antiseptic precautions.

The evening session, which was opened with music by the

Iowa State College glee club, proved a most interesting and profitable one from a literary viewpoint. Dean Stange of the veterinary school gave an address upon encephalomyelitis in horses, in which he reviewed the literature upon the disease, both European and American, also presenting the symptoms according to his own observations, all of which were extremely interesting and instructive. Dr. Bergeman presented a paper on therapeutics, discussing more particularly the effects of four important drugs; the hour had grown so late by the time Dr.

Agricultural Hall.

Bergeman had finished his subject, that discussion of it had to be foregone.

Wednesday dawned bright and cheery after the rain that had persisted all day Tuesday, with nearly two hundred veterinarians registered, and after disposing of considerable committee work, unfinished and miscellaneous business, Dr. J. W. Griffith, of Cedar Rapids, presented a paper on sanitation, in which he urged a closer supervision of milk production for cities. Instructive papers on surgery were then presented by Drs. H. E. Bemis, F. R. Ahlers and F. J. Nieman, which with some further committee reports, took up the forenoon. At 1:30 Prof. W. L. Williams, of Cornell University, began his stereopticon lecture on sterility, which was very much appreciated. Dr. Williams'

lecture was followed by a paper on peritonitis, by Dr. Wm. Drinkwater, and one by Mr. Geo. Judisch, professor of pharmacy at the veterinary school, on "Materia Medica—Progress and Problems." The papers for the day were brought to a close by Dr. F. R. Copeland, who described an acute disease among cattle with nervous symptoms which was very interesting. The election of officers which placed Dr. D. H. Miller, of Council Bluffs in the office of chief executive, Drs. W. A. Heck, West Liberty, and G. A. Scott, Waterloo, first and second vice-presi-

Margaret Hall, the Home of the Young Women of the College.

dents, respectively, and reinstated Dr. C. H. Stange as secretary, and the election of more than sixty new members to the association, completed the second day's work.

The evening was devoted to a banquet held in Margaret Hall, the home of the young women of the college, and given to the association and its guests by the Iowa State College and the citizens of Ames, at which more than two hundred of both sexes sat down. The food for the entire banquet was prepared and served by the young women of the college, students of home economics, and we feel assured that no better food or prettier service was ever given at any banquet, and the hall in which it

was served was a perfect flower show, so beautifully had it been decorated for the occasion. Another one of the uncommon features at a banquet of a veterinary association was a quartette, of which Dr. J. I. Gibson, of De Moines, was the leader, and his deep bass delighted the hearts of all present. One or two selections were given between each of the addresses; the one nearest to Dr. Gibson's heart being "Iowa," during the singing of which his face expressed great pleasure. Dr. H. E. Bemis proved a splendid toastmaster and preceded each of his introductions with

Central Building.

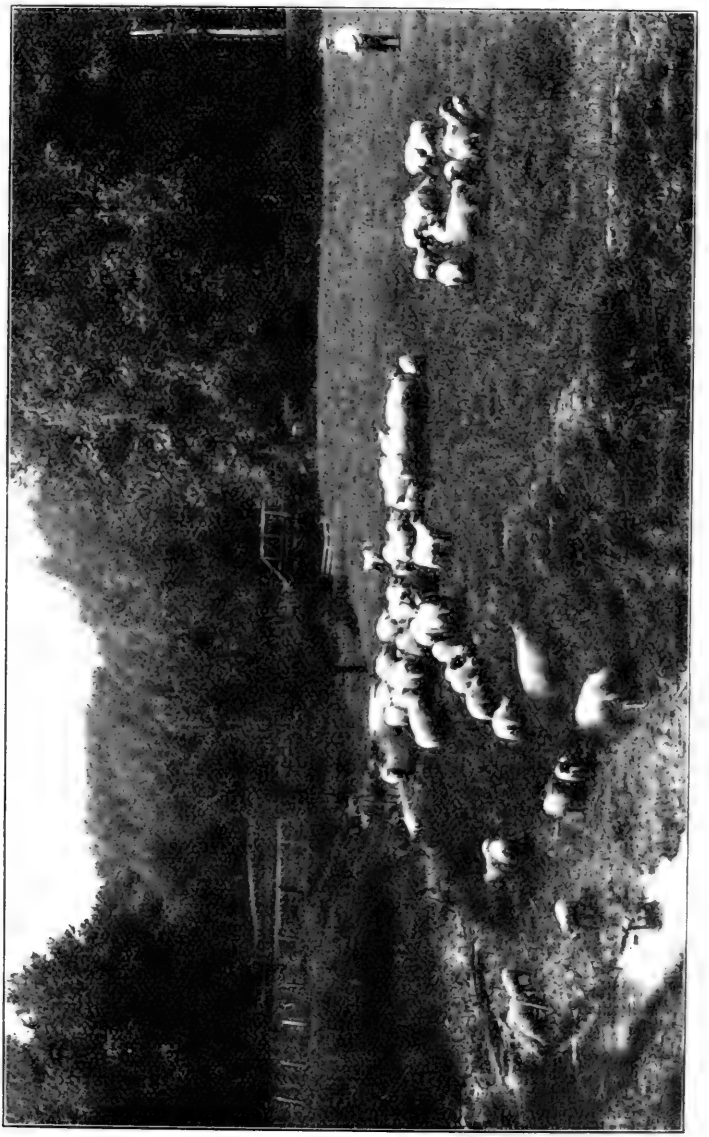
a humorous story. It was midnight when the festivities were brought to a close.

Thursday was given up exclusively to a surgical and diagnostic clinic, at which Prof. W. L. Williams did an operation for roaring, spayed a mare and mended a split ear on a pony. Dr. Bemis did a tracheotomy, Dr. Malcolm operated on an umbilical hernia, Dr. Miller on a cryptorchid, Dr. Nieman did a repulsion of the fourth molar and Dr. Stewart (Iowa) operated on a fractured rib. There was also a diagnostic clinic of cases of lameness, small animals, and, of great importance, hog

cholera subjects, over which post-mortem lectures were given by Drs. Niles and Dimock, which were very interesting and very instructive.

That, in brief, is an outline of the silver anniversary meeting of the Iowa Veterinary Association; minutiae and statistics will be furnished by Secretary Stange and published in a subsequent issue when received. But we cannot leave the beautiful campus without a look at its many excellent buildings, so before we go farther let us peep into some of the corners of the veterinary buildings we have not yet seen. One of the wonders of the veterinary school is its dean. The manner in which he managed to play the dual rôle of dean of the veterinary faculty and Secretary of the Iowa Veterinary Association the three days of the meeting was remarkable. He seemed to manage to keep in touch with his office and with the meeting in session at the same time. You walk into the assembly hall and you find him sitting on the platform beside President Sayers, recording the proceedings; you walk into his office and you find him standing beside his desk dictating to his stenographer, and while doing so he extends his cordial hand and welcomes you with a friendly smile. But you do not want to intrude too much upon his time, of which you know he has none to spare and you wander back into the building and suddenly find yourself in a large dissecting room with several horses on their feet suspended by hooks and chains, so that the superficial muscles can be dissected in the standing position. Over to one side you see an iron door in the floor which reminds you of those seen in the large killing floors of the abbattoirs, and your curiosity leads you to the floor below, where you find a rendering plant for the disposition of all the offal from the dissecting room; these were two things not described in the account of the college given in the October number of the REVIEW and you are glad you found them. Other features that interest you are the large operating rooms, the operating table and the "Rech-Marbaker," horse ambulance standing in readiness. But time presses and there is much to be seen on the campus that overlooks twelve hundred acres of col-

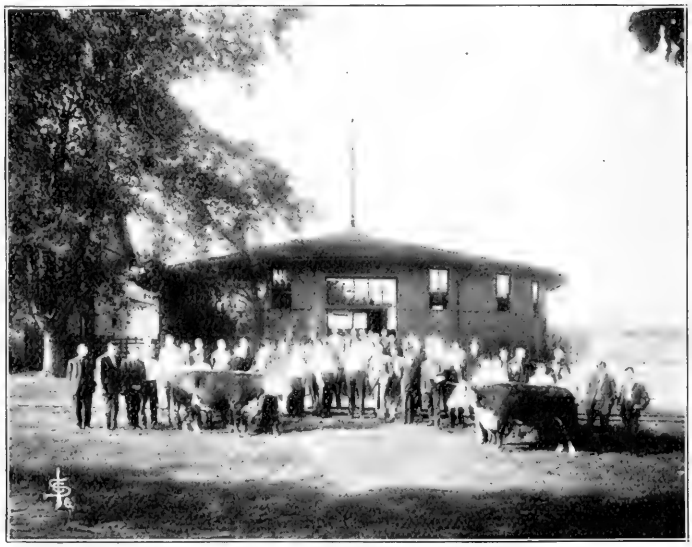
lege lands dotted with flocks and herds. So you journey up to the central building, in which the president, registrar and deans



A Flock of Sheep on the College Campus, Ames.

of some of the schools have their offices, it is the administration building, and you are impressed with its beautiful appointments

as you are pleasantly received in the several offices. Morrill Hall next holds your attention. You then go over to Agricultural Hall, the main building of which contains the offices and recitation rooms of the agricultural, engineering and veterinary departments, in addition to which there is also an annex, affording large and commodious rooms for drafting, reading, etc. Then you are desirous of seeing Margaret Hall, used exclusively for home economics work, and the home of the young women of the college. Your first visitation to it was at night, and you saw



Class in Stock Judging at Ames.

only the entrance and the beautifully decorated banquet hall, but now you are impressed with the beauty of the exterior. But you are desirous of seeing some of the stock and to know something of the breeding work at Ames, so you go down into the stables and on your way pass a flock of sheep. You pass through the cattle barns where you see fine specimens of Shorthorns, Black Angus, Herefords and many others, out into the horse barns, where you find "Dappel Tom," an imported eight-year-old Shire stallion, weighing 2,200 pounds, and another imported

Shire stallion, "Marman," five years old, not quite so heavy. The first one was imported as a three-year-old, and the second one as a two-year-old. These horses are used to cross on Percheron mares, and they are crossing Percheron stallions on the Shire mares. From here you pass out into the sheep pens where you see splendid specimens of Shropshires, Hampshires, Oxfords, Cotswolds and Southdowns; and continuing on you come to the hog yards, where you find that breeding is not being neglected, for you encounter some Hampshires, Berkshires, Poland Chinas and Duroc Reds. And just as you turn to leave the hog yards, standing on a knoll, you look across a little valley to a group of weanling colts in a paddock, in which are represented Clydes, Belgians and Shires, and you realize the advantages that such surroundings offer to veterinary students, and what opportunities they have of becoming proficient in stock judging. Then on to the dairy building, where you meet Professor Mortensen, who initiates you into the mysteries of how to make butter, cheese, ice cream, etc., by the latest machinery and with the least number of bugs per c.c. And so, although you have been compelled to hurry, you have gained an impression of the great work that is being carried on at that time-honored institution, the Iowa State College; and you can understand why all the men that you have met in your own profession that came from there are above the average. The facilities are there and a spirit of earnestness and honesty of purpose pervades the atmosphere. God bless old Ames!

THE HOG CHOLERA PROBLEM.

The problem of the prevention and control of hog cholera is so important and so perplexing, and therefore of such vital interest to rural veterinarians, that the REVIEW has given freely of a great amount of space to its discussion and elucidation during the last few years, and invites short to-the-point articles discussing this many-sided question. For until it can be definitely determined as to whether the serum-only method or the

serum-virus method offers the greater immunity against the disease and the greater protection to the hog owner the full value of either method will not have been realized. For so long as the profession is not in a position to be a unit on that, as any other question, its *clientèle* must of necessity continue in an unsettled state of mind. That there is not uniformity of opinion is not because the matter is not receiving attention; for it is receiving the very earnest attention of some of the brightest minds in the veterinary profession to-day; but as in all great problems, two sides are always presented; and if carefully presented and honestly met sufficient light must eventually be shed to remove the last shadow of doubt as to the safe and sane method to be adopted. In our October number we published the views of a recognized authority on the subject, Prof. M. H. Reynolds, of Minnesota, and in our November number an article by no less an authority than Prof. R. A. Craig, of Purdue University, while in our present number we have articles on hog cholera by Drs. C. D. McGilvray, of Winnipeg, Canada; F. M. Starr, Odessa, Missouri, and E. A. Buxton, Vinton, Iowa. We would suggest the reading of all these articles carefully and making a mental comparison of them with your own experiences, and then the brief compiling of the vital points as you see them, printed in the REVIEW's pages, would make interesting and valuable reading for your professional brothers.

Resurgam.

It is with profound sorrow that we announce the death of Mrs. Samuel Brenton, of Detroit, Michigan, on November 23, 1912. Every member of the American Veterinary Medical Association sympathizes with its latest past-president, Dr. Brenton, in his sad bereavement; a sympathy shared by all veterinarians and their wives throughout the country; as the sweetness of character of this good wife and mother had endeared her to all whose privilege it was to know her.

ORIGINAL ARTICLES.

A REPORT OF OVER THREE YEARS' EXPERIENCE WITH THE SCHAFER PHYLACOGENS IN THE TREATMENT OF INFECTIONS IN HORSES*

By F. M. Sawyer, M.D.C., Bakersfield, Cal.

Although I have long realized from the great variation of the clinical symptoms in different cases of the same disease that many of the commoner infections are mixed rather than pure infections, the use of the phylacogens in the beginning seem emperical to me. However, I had great confidence in Dr. Schafer, whom I have long known, and besides I knew that for some months he had been obtaining wonderful results in the human field with exactly the same preparations, so I felt no hesitancy in using them on horses. Now that men of authority in the medical and veterinary world have taken up the use and study of the phylacogens, I am content to await their decision as to the true explanation of their effect rather than to attempt to justify my use of the phylacogens by offering an explanation of how they act therapeutically. I am actuated in making this presentation, however, because my long experience has convinced me that I can cure conditions surely and promptly with the phylacogen, which formerly were very resistent to treatment and not infrequently ended seriously.

In this report the writer to facilitate discussion presents his cases in two groups—"field cases" and "hospital cases." The former group includes cases treated at considerable distance, in which daily observation, daily treatment and records were not practical and where there was very little experienced help to carry out adjuvant treatment. In most of these cases two or three doses on consecutive or alternate days brought about cure

* Fourteen cases in connection with this report are published on page 334 this issue.

or such improvement that the animal required no further attention. For this reason the discussion of the field cases is mainly a statement of the general facts noted.

The latter group includes only cases treated in the hospital or at the owner's place, if close enough at hand to permit daily visits, treatment, and keeping records. The discussion of these cases brings out more of the special points and the case histories appended are selected from among this group.

At first I gave the phylacogens intravenously, but soon found I also had to give them subcutaneously; with an animal easy to handle and good facilities for operating and warming the phylacogens I give the dose intravenously; with an animal difficult to handle, poor facilities for operating and warming the phylacogen, I give the dose subcutaneously. I would add that in giving a subcutaneous injection I use a 1-inch needle and simply thrust it in obliquely—this very often gives a partial intramuscular injection.

I have never seen a sudden death follow immediately after injection, or even within three or four hours, except in terminal cases. This occurred a few times early in the work; now I never inject a terminal case without explaining to the owner the possibility of the animal dying in the reaction. The decision then rests partly with the owner as to whether the remedy shall be given or not.

At first the reaction obtained with the intravenous injections were very striking; rapid breathing, staring coat, staring eyes, trembling and muscular rigors came on rapidly in about that order and always accompanied by rapid, weakened pulse. In about half the cases sweating followed the symptoms. These symptoms were due to the large dose and at times no doubt to the phylacogen being too cold. In four cases prolonged rigors and convulsions occurred, but none of these cases terminated fatally. When first seen these symptoms caused me some worry, but after seeing quite a number of cases, I soon learned that they were not serious. These reactions, however, led to the reduction in dose, slower injection, greater care of the needle and syringe, and the warming of the phylacogens to body temperature.

The reaction with the subcutaneous injections are practically all local. At the site of injection there occurs in six to twenty-four hours a variable amount of swelling which may be painful or tender and persists for twelve to forty-eight hours—a rise of temperature occasionally followed by sweating are the only symptoms of general reaction I have noted. I have never seen rapid breathing, trembling or rigors following subcutaneous injections.

The appended tables give the list of conditions treated, number of cases of each kind treated and results obtained. They cover the period from June, 1909, to November 1, 1912. I would explain that in both tables under the heading of Distemper I have included only the catarrhal form of influenza, which affects colts and young horses, in which running from the nose, watery eyes, laryngitis and more or less glandular swelling are the most constant and predominant symptoms. Under the heading Influenza I have included all other forms of influenza.

TABLE OF FIELD CASES.

Conditions.	Number of Cases.	Prophylactic.	Cure req. not more than 3.	Cure req. not more than 6.	Deaths.	Phylacogen Used.
Distemper.....	250	100	120	25	5	Mixed infection; distemper.
Influenza.....	150	25	95	25	5	Mixed infection; influenza after April 1, 1911; pneumonia.
Poor condition.....	50	...	50	..	..	Mixed infection.
Abscess.....	25	...	25	..	..	Mixed infection.
Total.....	475	125	290	50	10	

TABLE OF HOSPITAL AND NEARBY CASES.

Conditions.	Number of Cases.	Cure req. not more than 3.	Cure req. not more than 6.	Cure req. more than 6.	Deaths.	Phylacogen Used.
Distemper.....	12	4	8	..	..	Mixed infection; distemper.
Influenza.....	25	5	11	2	7	Mixed infection; influenza; after April 1, 1911, pneumonia.
Surgical infections..	12	12	..	..	...	Mixed infection.
Laminitis.....	12	12	..	..	..	Mixed infection; also pneumonia.
Poor condition.....	5	5	..	..	..	Mixed infection.
Azoturia.....	4	3	1	..	..	Mixed infection.
Navicular disease...	1	..	..	1	..	Pneumonia.
Total.....	71	41	20	3	7	

Discussing the Table of Field Cases.

It will be noticed that this includes 475 cases. This may seem a large number, but as veterinarian for the Kern County Land Company the writer had opportunity in 1909 and 1910 (when distemper and influenza in a severe and malignant form were much prevalent) for treating three bands of horses, each numbering upward of fifty head, and on numerous occasions bands of five and the head were injected on successive or alternate days. From this it will be seen that the estimates given are really conservative, and this is also the explanation for the estimates appearing in round numbers.

Considering the Conditions in Detail.

1. *Distemper*—250 cases (1): Of this number I considered 100 cases as having been treated prophylactically, as they presented no symptoms at the time of injection. These received but one dose and were not reinjected unless they developed symptoms; less than ten cases needed a second dose and this despite the fact that no attempt was made to isolate them from those animals which presented definite symptoms. One hundred and twenty cases required not more than three doses, and 25 cases required more than three, and not over six doses to be entirely cured. Five cases terminated fatally. These were all cases of the irregular type, in which internal abscess was the complicating feature.

2. *Influenza*—150 cases (2): Of this number I considered 25 as having been treated prophylactically—they were treated the same as the distemper cases, none of these developed symptoms. Ninty-five head required not more than three doses, and 25 required more than three, and not over six doses to be cured. Five cases terminated fatally—these were all cases of the irregular type in which pneumonia occurred as an early complication. I wish to add here that none of this group which developed pneumonia got well, and this in spite of the very best possible attention.

(1) In this group of cases I used Mixed Infection Distemper Phylacogen.
(2) In this group I used Mixed Infection Influenza Phylacogen early in the week—after April 1st, 1911, I used Pneumonia Phylacogen.

3. *Poor Condition*—50 cases (3): This is a rough estimate, I feel sure there were more cases. None of these required more than three doses. I followed the routine of giving one dose (usually 15 c.c. intravenously) and following with a second dose (usually 30 c.c. intravenously) if necessary at the end of seven to ten days. I consider the results in this class of cases very wonderful. Early in the work I noticed that no matter for what condition I gave the phylacogen the animal, after being cured, was invariably much improved in general strength and picked up noticeably in weight, so constant was this that after five or six months' experience I began to give the phylacogen to horses that were in poor general condition and could not pick up in weight.

4. *Abscess*—25 cases: In this group I include only very large abscesses; here I followed the plan of supplementing the surgical treatment with one or two doses of mixed infection phylacogen, and invariably obtained such rapid healing that the phylacogen had to be credited with the result. None of these cases received over three doses. Right here let me add that in any condition where there is localized pus formation the phylacogens can produce a cure only if proper surgical drainage is made. This explains why in diseases complicated with internal abscess no cure can be brought about by giving phylacogen. In these cases one gets a typical reaction with a rise and fall of temperature, and even relief of pain, but it will be noticed that in such cases the temperature never goes quite down to normal (it may go very nearly to normal) and in a few hours (six to eight at the most) begins to go back up to where it was before the administration of the dose. The pulse here usually stays rapid and weak, instead of getting slower and stronger as is the case when cure follows—the animal gets rapidly weaker and the phylacogen if persisted in under such conditions adds materially to the burden of the beast.

Summary of Field Cases.

Administration—Not more than one-third of the cases received intravenous injection. This included the older and better

(3) In these cases I used Mixed Infection Phylacogen.

horses, which also received adjuvant treatment when necessary. The balance received subcutaneous injection—these included suckling colts, yearlings and young animals.

Site of Injection—In intravenous injection, the jugular vein is used. I usually alternate from side to side, choosing a point about 1½ inches away from the previous injection. Subcutaneously, I usually give it in the neck, except in suckling colts where I give it just back of the shoulder.

Dose—In the beginning I gave 15 to 60 c.c., whether given intravenously or subcutaneously, except in young colts, where I gave 7½ to 30 c.c. Since March, 1911, I give 7½ to 30 c.c., except to colts; these I give 5 to 15 c.c. In the subcutaneous method it has been and is my custom to give the maximum dose from the first, while in the intravenous method I start with the minimum and gradually increase the dose as necessary.

Reaction—As above stated, the reaction with the intravenous method were severe early in the work. Since January, 1910, the usual reaction symptoms which I obtain are uneasiness, increased rapidity of breathing, urination, occasionally trembling with staring coat; in a few cases the animal lies down. In the subcutaneous method the reaction is practically all local.

Interval—In this class of cases 24 to 72 hours. This was due to the number of injections and the attending circumstances. It was the aim to inject these cases every 24 hours, but if this was inconvenient for any reason the injections were often postponed 24 to 48 hours, making the interval as above stated.

Results—It will be noticed that there were deaths only among the distemper and influenza cases—in both of these groups they were all cases in which the animal when first seen had irregular symptoms. Those of the distemper group were complicated with abscess formation internally; those of the influenza group were complicated with pneumonia. In quite a number of these cases the conditions were verified on opening the animal after death. Ten deaths in 400 is a very low percentage, considering the severity and malignancy of the distemper and influenza prevalent at the time, and the number of colts and young horses

affected. I have included the prophylactic cases in the total of cures, because in my experience when distemper and influenza get into a band of colts and young horses very nearly all get it before the disease is stamped out.

DISCUSSING THE TABLE OF HOSPITAL AND NEAR-BY CASES.

This lists but 71 cases. I have included only such cases as were treated in the hospital or near by where it was practical to see and treat the animal every 24 hours and keep a record of the treatment and clinical condition.

Considering the Conditions in Detail.

1. *Distemper*—12 cases: Of these, four cases required not more than three doses and eight cases required more than three doses and not over six doses to be cured. In this group of cases there were no deaths. All of these cases were of the severe form and some were brought in for treatment after being worked for a number of days while they were sick—this accounts for the greater number of doses necessary. Many cases were lost at this time before the phylacogen treatment was instituted.

2. *Influenza*—25 cases: Of these, five cases required not over three doses, 11 cases required not over six doses, and two cases required upward of six doses to be cured. All of these cases were of the severe form, and some were brought in for treatment after being worked for a number of days while they were sick. This accounts for the greater number of doses necessary. Seven cases terminated fatally. These were all cases which presented pneumonia symptoms when first brought in for treatment.

3. *Surgical Infections*—12 cases: This includes four large abscesses, three infected punctures, four infected lacerations and one bursal infection. In these cases I routinely gave only three injections and invariably was rewarded with rapid healing. Cases which ordinarily run from three to four weeks usually get well in from ten days to two weeks. The animal is early relieved of pain and is able to work much sooner.

4. *Laminitis*—12 cases: None of these cases required over

three doses to be cured. The results in these are very prompt, and the condition seems entirely overcome—no tenderness remains and the animals can go to work on the fifth or sixth day. In five of these cases I have had opportunity for subsequent observation and there has been no recurrence. Of special interest is the fact that the last two cases treated made a very prompt striking recovery with pneumonia phylacogen which I gave because I was out of mixed infection phylacogen.

5. *Poor Condition*—5 cases: None of these cases required more than three doses. All were treated intravenously with two doses mixed infection phylacogen, at a seven to ten-day interval. This is a condition which I recommend for the serious consideration of the veterinarian; many horses can be much increased in value by this treatment.

6. *Azoturia*—4 cases: Three of these cases received five doses; one case received five doses. In all of these cases I gave the phylacogen as adjuvant treatment, expecting thereby to control the infective complications of the urinary and enteric tract—all of the cases received the regular approved medicinal treatment besides. In these cases I gave the mixed infection phylacogen subcutaneously in doses of 15 to 60 c.c.

7. *Navicular Disease*—1 case: This required eight doses and was given pneumonia phylac. I was actuated to treat this case with phylacogen because of the rather prompt and complete results obtained in two previous cases of severe laminitis, both of which received pneumonia phylacogen because I happened to be out of the mixed infection phylacogen. After the second dose the animal was much relieved of pain, and after the fourth dose seemed entirely free from pain. Because of the special interest I have appended this case history in detail.

Summary of Hospital Cases.

Administration—Before April 1, 1911, about one-half of the cases received intravenous injection. Since then practically all have been treated intravenously.

Site of Injection—As given on page 278. Right here I wish

to say that in the intravenous method the care of the needle and syringe is the important thing. There is more danger in injecting a small drop of oil or a small shred from a syringe plunger, or a small blood clot than from any amount of air that could be injected with a syringe under usual conditions. The following is my routine for taking take of the needle and syringe: After making an intravenous injection, I carefully rinse the needle and syringe barrel with cold water which may or may not be sterile, I then rinse in 95 per cent. alcohol, which removes all the water and allows the syringe and needle to dry without rusting. I always replace the wire in the needle. They are then ready to be put away until needed again, when all must be boiled before using. This method is especially effective in keeping a needle smooth inside—a very important point in avoiding small blood clots in the butt or shaft of the needle. In opening the phylacogen container I use three or four ply of gauze saturated with 65 per cent. alcohol, with this I remove the rubber cork, laying the same down carefully in the gauze; I then withdraw with the syringe the amount of phylacogen I wish to use *through the needle,* after which I carefully replace the cork, holding the same with the gauze saturated with alcohol—this prevents contamination of the phylacogen as effectively as is possible under the ordinary circumstances with which the veterinarian meets in his work and the remainder can be kept for several days and used at will.

Dose—I now give 7½ to 30 c.c. whether given intravenously or subcutaneously. In the subcutaneous method I usually start with the maximum dose and continue it throughout. In the intravenous I start with the minimum dose and increase as necessary. The rapidity with which I increase the succeeding dose depends entirely upon the degree of reaction obtained with the preceding dose—with no reaction or very mild reaction I double the dose and give it 24 hours later—with a moderate reaction I increase the dose one-half and give it 24 hours later—with a strong reaction I repeat the dose and give it 24 hours later. In very young colts I have found 15 c.c. a very effective subcutaneous dose.

Reaction—Of late the usual symptoms of reaction which I obtain with the intravenous method are uneasiness, increased rapidity of breathing, staring coat, urination and occasionally trembling and lying down. With the subcutaneous dose the reaction is practically all local. It is my custom to explain to the owner what symptoms may be expected after an intravenous dose; I also inform him that considerable swelling follows the subcutaneous dose. This reassures the owner and often saves considerable time.

Interval—In this class of cases it is invariably 24 hours.

Results—It will be noticed that there were deaths only in the influenza cases. Seven deaths in 25 cases seems a high mortality. However, these cases were all cases in which the animal was brought in late for treatment and presented symptoms of pneumonia—three of these cases had been worked up to the time they were brought in for treatment. In all of the cases it was evident that the animal had very little resistance left when brought for treatment. I considered all these cases terminal cases, and in each instance explained to the owner that the animal had little or no chance for recovery and that I was giving the phylacogen as a last resort. It will be noticed that 13 of the 18 cases which were cured required six doses or upward. This is explained in the same way; *i. e.*, the animals were brought in late for treatment.

From My Experience I Conclude That—The phylacogens are safe therapeutic agents to administer. I point to the large number of cases, 546, injected without a single death that could be directly attributed to the administration of the phylacogen and to the occurrence of alarming rigors and convulsions in less than 10 cases.

The phylacogens are practical for use in the regular routine work of the veterinarian—both in his outside work and in hospital work.

The phylacogens are economical in cost. They cost less than serums. Because of rapid cures obtained, they cut down loss by hastening the animal's return to work. They cut down cost by

shortening the time during which the animal needs the attention of a caretaker. They improve the general condition of the animals, as they usually gain in weight and strength after a course of phylacogen.

The phylacogens are reliable therapeutic agents. I point to the fine percentage of results obtained in my experience and the period of time—over three years—through which they have continued to give good results at my hands. I consider this very convincing.

In closing, I will suggest that the veterinarian, to acquire experience and gain confidence in his "working stroke," begin the use of phylacogens by administering them subcutaneously, and at first only to hospital cases or cases sufficiently near that daily observation and treatment is practical. I can assure any veterinarian who believes that the bacterial preparations have a place in therapeutics, that the phylacogens are the very best of this class of remedies and their intelligent use will give him good results far beyond his expectations in many refractory and serious conditions.

During the period when Dr. Schafer was making the Phylacogens in his laboratory, in Bakersfield, Cal., it was his custom to keep up his cultures of the various organisms used in making the Phylacogens by obtaining fresh growths whenever opportunity was afforded by outbreaks of infection in both veterinary and human field; so it was quite natural that he availed himself of cultures from the horses suffering from distemper and influenza, so that he could add these two factors to the basic Mixed Infection Phylacogen, thus conforming to the idea of giving a predominant factor to the phylacogen, intended for treating a condition known to have a predominating causal organism. The names Mixed Infection Distemper Phylacogen and Mixed Infection Influenza Phylacogen were therefore necessary at the time to designate and differentiate these two from the other phylacogens—pneumonia, erysipelas, etc. My thanks are also herewith extended to the veterinary biologic and research department of Parke Davis & Co. for the courtesy of experiments and supplies of phylacogens, which enabled me to continue my work after Dr. Schafer discontinued making the phylacogens in Bakersfield.

Potent Twin Bulls.—On page 723, issue of October 9, I read with interest G. T. Burrows' article on the free martin heifer, especially the translation from Spiegelberg. In Dean Davenport's "Principles of Breeding" (note at bottom of page 176), the same statement is found (quoted from Geddes & Thompson's "Evolution of Sex"). I remember that a Short-horn cow owned by Conrad Welch, then a resident of Fulton County, Indiana, gave birth about 1892 to twin bull calves, both of which were afterward used as sires in the neighborhood, so I know perfectly normal twin bulls may be born.—John T. Montgomery in *Breeders' Gazette.*

ARTERIOSCLEROSIS EPIDEMIC IN SHEEP.

By Fred Torrance, M.A., D.V.S., Ottawa, Can.

Translation of an Article by Prof. Jose Lignieres, in the Revista Zootecnica for August, 1912.

In 1898 I published the result of my first studies which was observed to be contagious among cattle, horses and sheep belonging to certain districts in the Argentine Republic.

In the bovine species the disease was known before my arrival at Buenos Ayres, and called by the name of "Enteque," an improper term, which signified "etisis" or extreme weakness (flacura), and also made itself known by the spongy ossification of the lungs which served to characterize it.

I showed that the pulmonary lesion was not the principal one and that it should be looked for in those arteries which are always attacked by lesions of arteriosclerosis more or less generalized. These lesions are often met with in the arteries when the spongy ossification of the lung does not exist at all.

I have been able to follow the disease from its inception when not existing in the calf of eight or ten months, and the intestinal disturbances, which exist in the majority of cases in an infectious chronic enteritis. In the animals affected by this diarrhœa, and which resist the disease, are found lesions of the arteries, in the beginning discerned on the common aorta; they presently extend and become hard and can become generalized throughout the arterial system and as far as the pulmonary artery. When the arterial lesions are important, you may find lesions of spongy ossification in the lungs.

The arterial and pulmonary lesions of "Enteque" are generally preceded by digestive disorders, so that there is reason to believe that these disorders indicate as their origin an intestinal infection.

I showed that the horse is also attacked by the disease, but I

have never met in it the spongy ossification of the lungs, even when the arteriosclerosis was considerable.

In the sheep chronic arteritis is also found, but no pulmonary disturbance. Only recently have I observed it in a genuine outbreak of "Enteque" among a large flock of Lincoln sheep in the Province of Buenos Ayres in the region of Castelli.

I published in the *Revista Zootecnica* for the month of October, 1910, a brief note in which I made known for the first time the possible existence of lesions of spongy ossification in the lungs of sheep.

To-day I am giving greater details concerning this disease of sheep in order to discuss the cause to which it is attributed by Dr. Fedorico Sivori in his treatise published in the *General Review* of March 1, 1912, under the title of "La Mancha in Sheep" (Mancha=stain or spot).

I cannot have any doubt regarding the identity of the disease studied by Dr. Sivori with that which I have observed since our investigations were carried on in the same period and in the same country district.

Symptoms.—In the sheepfolds attacked the animals appeared to be in good condition, except some which seemed to be weak and anæmic.

It is not difficult to know the sick ones. It is only necessary to hurry them up a little to see, in following, that some of them lay behind or stop, with their flanks very much agitated, and the dejected look of animals whose breathing is difficult. These animals are sometimes found to be in an excellent state of nourishment, and do not appear at first sight to be suffering from an infection. They eat and drink perfectly.

It is an important point to notice that natural death may come on even during sleep (rest), suddenly and sometimes painlessly, as in the case of carbuncle, a disease with which, by some people, this has been confounded.

Also, accidents, sometimes fatal, can be produced. For this it is enough to frighten the sheepfold to oblige all the animals to run. Then the sick ones stop suddenly, some fall to the ground and die as if delirious.

Lesions.—After death, those animals whose digestive tubes are found full of food, swell up immediately. Sometimes a foamy serum, red in color, flows through the nostrils, which tends still more to confuse the disease with carbuncle.

If the skin is drawn out, the subcutaneous capillaries are found gorged with coagulated, highly colored blood, some pale, forming in the conjunctive tissue numerous arborizations (1). Especially in the case when the autopsy has been delayed, the tissues of the side on which the body has been stretched out on the ground, are found to be infiltrated with a red serum or with gelatinous oedema. In different parts are found very dark "placas" (2) lit. stars). forming spots or stains on the skin which are almost black. Hence, the name of "Mancha" (spot or stain).

The muscles, like the blood, keep their normal tint or are pale, infiltrated with serum, according to the state of nourishment or of anæmia of the animals.

In the serous cavities, peritoneum, pericardium, pleura, there is frequently met a quantity, sometimes a considerable quantity, of serum of a bright lemon or reddish color.

Generally, the digestive tube is found congested, full of gas, and the bloody arborizations are very visible. The red infiltrated mucus is easily drawn out.

The spleen, the liver and the kidneys are also often very congested, but, contrary to what occurs in the case of carbuncle, the spleen presents more or less its normal volume.

The lungs are always found infiltrated, edematous, congested and even hepaticized in different parts. In some cases there is situated in them a quantity of small bodies, hard and elongated, in the shape of needles, which break (crack) easily between the fingers, and formed by a true spongy ossification. The vain of the neck contains blood which reddens in the air and coagulates. The aorta is hard and thick and inelastic to the touch. At the opening are met at its base lesions of arteriosclerosis, at times enormous, like those which I am showing in the attached illustration. These lesions by themselves explain

the accidents occasioned by violent and prolonged movements. Death is produced by asphyxiation due to oedema or congestion of the lungs.

I should note that these congested lesions of the viscera are observed in the case of death, but they are not discovered if the animals slaughtered are still healthy in appearance.

A fact of importance consists in the finding, in some sheepfolds attacked by the disease, or lesions of tuberculosis with the Bacillus Preisz-Nocard, a disease rather generalized in the Argentine. In other cases these lesions do not exist (in any manner, as we see it further off).

In the sheepfolds attacked, the disease is observed in the males as in the females, but never in lambs under this form. It lasts some months, causing the death of several animals daily, almost always in winter. I saw a flock of 6,000 head lose 700 between May and October, 1910.

Here is the result of an experiment which demonstrates the gravity of the disease, its duration, the possibility of diagnosis, the production of sudden death even in a state of complete rest, and, finally, the variable aspect of the secondary lesions and the constancy of the lesions or arteriosclerosis.

On October 17, 1910, there arrived at the laboratory five sick adult sheep, sent from an owner in Castelli, where they were selected for our experiments. These animals were immediately placed in small corrals. In all of them the auscultation revealed grave cardiacal disorders and the percussion proved mastitis or sub-mastitis, almost wholly in the lower part of the breast.

Three of them were found in a good state, the other two were weak and anæmic. One stayed on the ground, unable to rise, with discordant breathing. The practitioner bled one to make a study of the blood and serum; then killed it.

Here are some of the observations of the autopsy. The subcutaneous conjunctive tissue is humid; in the muscular interstices is a transparent serum; there was even found fat in rolls with serum. The blood is rather pale, but the muscles preserve dark tint.

In the peritoneum is found about a litre of clear liquid. The digestive tract was found almost empty of food owing to the fast of the journey and the change of diet which the animals suddenly underwent in going from a green to a dry pasture. The mucus of the digestive tube had in different parts scattered red plaques. The spleen was of its normal volume; the liver and kidneys showed nothing out of the ordinary, nor did the lymphatic glands. In this case the bleeding had impeded the formation of congestions which characterize the lesions in those animals which succumb naturally and has not produced intestinal fermentations.

In the thoracic cavity were found ten litres of rather limpid serum, slightly yellowish (jaundiced). In the lungs were some hard spots, hepaticized. Their edge was compact, homogeneous, granulated and "violaceo." There was no spongy ossification in the pulmonary tissue.

The anterior and posterior aorta, as far as the lumbar bifurcation, present very marked lesions of arteriosclerosis. The pulmonary artery is normal.

The following days the other animals became accustomed to the dry diet; they appeared to improve.

On the 26th of December, 1910, one of them died, nothing being noticed the evening before. The animal was swollen. I discovered on the side on which the body was lying plaques of a dark red tint. In the intermuscular conjunctive tissue was seen a great quantity of serum of a reddish tint; there was no fat. In the peritoneum, pleura, and pericardium was found a good deal of red serum.

In the oedematous lungs were found some lesions of spongy ossification; the aorta contained chronic hard arteritis.

The spleen is soft with its volume scarcely increased; the kidneys and the liver congested. The open digestive tube from one end to the other showed some colored plaques in the mucus of the large intestine.

On the 12th of May, 1911, another animal died without any appearance of disease. It was well nourished, its blood was a

dark color, the muscles normal in color and containing a little serous infiltration in the tissues.

The liver, the spleen and the kidneys were very much congested. In the serous cavities was a serum that was scarcely red; in the lungs was observed generalized oedema, spongy ossification; in the arterial vessels were marked lesions of arteriosclerosis.

The intestines were found filled with food, the small intestine arborized by the capillaries; to the touch the intestinal wall was found rather infiltrated, the mucus highly colored.

The 2d of July, 1911, the second last animal died. The evening before it seemed to be very well. A colored foam was flowing from the nostrils. The animal was found in a good state of nutrition without anæmia. There was especially noted in the thoracic cavity a great quantity of lemon-colored serum; there was also in the peritoneum a little yellow liquid.

The small intestine, as in the preceding animal, was found very much congested; the spleen, with its normal volume, was dark in color; the liver, the kidneys were found gorged with blood.

In the oedematous lungs were distinct lesions of spongy ossification. The lesions of arteriosclerosis were very pronounced.

As in the other cases, there were serous infiltrations of the tissues. The blood is a dark color and coagulates well.

Finally the last animal died suddenly July 8, 1911, with the same lesions as the preceding.

In every case were made bacteriological investigations and numerous inoculations, but that part of my investigations which refers to the etiology of arteriosclerosis is still in coure of study. I limited myself to saying only that when the animals die the blood is almost always sterile, as also the viscera, and, in the meantine, when describing the dead animals, that the microbes found are sometimes numerous and belong to different species.

The Bacillus Preisz-Nocard has not been met with in any of the five animals whose history I have just finished relating. I have only met it in other cases when co-existing with purulent lesions of pseudo-tuberculosis.

What is the cause of the disease in sheep and of its principal characteristics which I have sketched?

In his work, Dr. Fedoric Sivori, Professor in the University of La Plata, maintains that it is a case of an acute intoxication due to the toxin of the Bacillus Preisz-Nocard, and since entitling his memoirs "La Mancha in Sheep," a name which he himself recognizes as unsuitable on account of the confusion which it caused, he proposed the name of "Sheep Toxinemia of the Bacillus Preisz-Nocard."

There is, according to this professor, a connection between this discease and the Red Disease studied in France by Carre and Bigoteau, and caused, according to these authors, by the toxin of the Bacillus Preisz-Nocard.

If the treatise of Dr. Sivori had not appeared in France, there would certainly not yet have been any publication by me concerning the disease which occupied us.

It has seemed to me that I should not dismiss without discussion the thesis of Dr. Sivori, taking chiefly into account his criticism of my works on the "Enteque."

What especially occupied the attention in Dr. Sivori's treatise was that he arrived at the conclusion of the preponderance of the Bacillus Preisz-Nocard, although only once has it been isolated in the body of sick animals. For that there was made an injection of 22 c.c. of the serum from the pleura of sheep No. 3 into the thoracic cavity of a healthy sheep and 20 c.c. under the skin.

The animal died after 14 days. At the point of the subcutaneous injection there was found to have formed a purulent, caseous spot, as also in the pleura and in the lung at the level of the inoculation.

It is clear that the product injected into the sheep referred to came from an animal accidentally attacked with pseudo-tuberculosis. But it is not therefore demonstrated that the microbe of this disease is met with in every case.

The other experiments of the author prove, on the contrary, that the Bacillus Preisz-Nocard does not always exist in the

carcasses and that its presence in the last case was not only a coincidence.

In fact, on Page 244, Dr. F. Sivori writes: "Regarding sheep which have died from "La Mancha" we notice immediately after death blood, serum of the sero-sanguinary oedema, disturbances of the "esplancicas" cavities.

The aerobic and anaerobic cultures do not permit the isolation of the specific agent of the disease.

The blood of a sheep, examined immediately after death and injected with doses of 3 c.c. in the peritoneal cavity of a guinea-pig, does not give any result.

The pleural serum examined under such conditions and injected in doses of 4 c.c. beneath the skin of a guinea-pig causes simply a little oedema which disappears at the end of 48 hours without any ulterior result. The injection of 40 c.c. of the same serum in the pleural cavity of a healthy sheep gives no result.

It is not necessary, then, to invoke my own experiments to demonstrate that the disease in sheep exists without the slightest trace of the Bacillus Preisz-Nocard.

Dr. Sivori has also made a statement which is of importance. On Page 255, he claims (?) with reason that sheep containing abscesses caused by the Bacillus Preisz-Nocard, are not more sensitive to the toxin of this microbe, which can be injected with impunity, even in doses of 3 c.c., which will a "testigo" in 40 hours.

But, then, how has this toxin power to kill in spontaneous "Mancha" sheep which contain abscesses with the Bacillus Preisz-Nocard as those which "senala" different times in their autopsies? The long duration of the disease is also opposed to his hypothesis of a toxic fulminating action. I recorded that the sheep brought from Castelli to the laboratory at Buenos Ayres died, one after two months, another after several months, and the two last after nine months. Their death was sudden and the lesions were identical with those which were found in the animals which died in the infected areas.

I could give other reasons too, but it seems to me useless to

pursue the subject. Neither the Bacillus Preisz-Nocard nor its toxin have any connection with the epidemic among sheep in Castelli (1).

From a clinical point of view, it seems to me very easy to explain the delirious death of the sick animals as a consequence of the enormous lesions of arteriosclerosis. The oedema, the serums, are the result of the impeded circulation, as well as the congestion and the oedema of the lungs, which cause the rapid asphyxiation and death.

To get at the actual cause of arteriosclerosis constitutes the object of investigations which have not yet ended. I can unhesitatingly say that I am convinced that it is due to a microbic affection of intestinal origin.

Conclusions.—The epidemic among sheep of the district of Castelli (Argentine Republic), described recently by Dr. Fedoric Sivori under the name of "La Mancha," or Sheep Toxinemia with the Bacillus Preisz-Nocard, and compared with the Red Water of Senors Carre and Bigoteau, cannot be attributed to this microbe, because it has been totally lacking in the majority of cases, and also because the disease, in view of its delirious (fulminante) type which can be seen in a first examination, is, on the contrary, a chronic affection lasting several months, and even several years. The hard, and often generalized lesions of arteriosclerosis found in all the sick animals, explain perfectly the phenomena observed and especially the delirious death.

Investigations are still necessary to determine the real cause of those genuine epidemics of arteriosclerosis whose origin appears to be intestinal affection.

(1) I propose at the first opportunity to examine the new and original method of diagnosis of the infections with the Bacillus Preisz-Nocard brought out recently by Senors P. Forgeot and E. Cesari.

MARRIED.—Mr. Charles Lamson Kelley was married on November 14th to Miss Kate Louise Beckley, daughter of Dr. and Mrs. Edgar Miles Beckley, Meriden, Conn. We wish the young people all the joy that wedlock brings.

THE NATURAL AND ACQUIRED QUALIFICATIONS OF A SURGEON.*

By Dr. R. C. Moore, President of the Kansas City Veterinary College.

The qualities of the surgeon are subject to at least two divisions: First, into those traits or qualities derived from ancestors either near or distant, inborn natural ability or that inheritance of the Creator that adapts one for a certain thing or calling in life; second, those qualities acquired during life, by training and practice.

Dr. W. J. Mayo, the noted surgeon of Rochester, Minn., has well said, "Our spoken language recognizes the truth in the word 'calling.' May not this be the way the Great Creator calls men to do his work in the various walks of life?"

History proves conclusively that to man has been given the power to meet every condition of life. No matter how great the necessity, some one has been found with the essential qualities to meet it, and in these individuals we find developed those traits or natural qualities that enable them to succeed in that particular thing, where others would have failed. This does not dispute the Divine Power of direct intervention, but proves the plan of human agency, so truly, "Man's extremity is God's opportunity." This principle is surely as true in the minor details of life as in the great crises of the world.

To become a surgeon it is not only necessary that the individual possess the natural ability to do surgical things, but it is also important that he should possess the qualities of a man in the broadest sense of that word. A man of strong character, sober, industrious, with broad philanthropy, keen perception, a determined will, a kind heart and uncompromising integrity, and one who honors truth for truth's sake. Possessing "the heart of a lion, the eye of an eagle, and the hand of a woman."

* Presented to the Forty-ninth Annual Meeting of the American Veterinary Medical Association, at Indianapolis, August, 1912.

The true surgeon has in mind only the welfare of his patient. Kindness should be his motto, and firmness to follow his convictions his password. The man who is cruel, unsympathizing and heartless, no matter how skilled, has no more right with the surgeon's knife than the crudest workman has with the sculptor's chisel. No true surgeon will cause the slightest unnecessary pain, yet with all h eis governed by judgment rather than sympathy.

A nervous individual is not calculated for a surgeon, as he is always subject to unnecessary errors. Deliberation of action is essential to the end that everything needful be done and no tissue be unnecessarily injured. If methods are not precise, needful things are likely to be omitted.

Courage is also an important factor. At times the surgeon must assume great responsibilities, and if he has not the courage to assume these promptly, the result may be disastrous. Promptness is of equal importance. No doubt many animals die for want of prompt surgical interference, as often a few hours will carry the patient beyond the possibility of successful surgical assistance.

A fearless disposition, steady, kind, firm, and a commanding way is of vast importance in veterinary surgery. Our patients usually recognize fear and timidity in those handling them, and are apt to take advantage of it. Likewise our clients and the bystanders are quick to note this defect and prompt to publish it to the surgeon's discredit. The owner and attendants of our equine patients are usually good horsemen and are often ready, and perhaps "rightly so," to criticise the lack of the same in the veterinarian.

I would not underrate careful, deliberate preparation, but emergencies arise that must be met promptly, and it is then that the surgeon must have the courage to act immediately and do the best he can under the circumstances. One should not fear criticism, for if he is satisfied that he did the best he could, that satisfaction is better than pleasing a multitude.

It is true that our country is fairly alive with surgeons. Is it true that they are successful? How many of them do things simply as they are taught to follow step by step some previous

instructor and when something out of the ordinary presents itself they are conspicuous for their lack of ability to devise a method of treating it?

Beware of the charlatan in our profession; whether he is an undergraduate or the possessor of a veterinary degree, if he follows the steps of a quack, he should have the brand. He who professionally, or otherwise, commits an act that tends to lower the professional or moral standing of the veterinarian, strikes a blow at every member of our profession. We should not be too free to condemn, for it must be remembered that mistakes extend even to the President's chair, but to uphold a premeditated, non-professional, dishonest act or to shield one guilty of such, is scarcely less detestable than to commit such an offence.

Is the judgment of the surgeon not too often influenced by mercenary consideration? Industrial economy enters more largely into our professional work than it does into that of our brethren who are charged with the welfare of human kind. As a rule, the animal is bred, reared and cared for to be of service or pleasure to its human owner. The right of the owner to use such animals for his pleasure or profit, even to the taking of its life, so long as he does not treat it cruelly, has not been seriously questioned. Recognizing this right, it would be the duty of the veterinarian to recommend the humane destruction of the patient whenever in his judgment, his skill as a surgeon cannot restore the animal to a condition of reasonable service or pleasure to its owner.

Too often operations are undertaken where the very nature of the case indicates so long a period of convalescence, or of so doubtful a termination that the treatment would be unprofitable to the owner, also the animal would suffer pain without profit and the surgeon lose his reputation and his client.

Public sentiment favoring humane treatment of defenceless animals is rapidly increasing all over the civilized world, and none should be more interested in its advancement than the veterinarian. So when a veterinarian causes serious or prolonged pain in the performance of surgical operations without the use

of anaesthetics, either general or local, he brings criticism upon himself and his profession. We are living in an advanced age of surgical success, and more is expected of us to-day than ever before, and we should ever be mindful that the requirements of man are in proportion to his opportunities. The one who does not give the best he has is unworthy. He owes it to himself, his client, and most of all to his patient, that every avenue of possible pain and danger be safeguarded.

The acquired qualifications of a surgeon should perhaps outnumber his natural ones, but they would be of little value did he not possess at least a reasonable share of the latter.

It has been said that "surgeons are born, not made." While this statement is the essence of truth, it may often lead to grievous error, for sometimes an apparently small amount of natural ability will develop to magnificent proportions under proper influence, supported by a determined will and ceaseless energy.

Surgery is an art and may well be classed as a fine art and students of the arts who become masters usually spend long periods of service under competent instructors. Why should he who would become a surgeon be exempted from such teaching?

The fundamental principle in the cure of disease is a correct knowledge of the conditions, hence the first acquired qualification for a surgeon is ability as a diagnostician, and to attain this one should begin at the lower round of the ladder. He first becomes familiar with all tissues of the living animal, including their form, structure, relation and action; second, he gains a substantial knowledge of disease, including its cause, anatomical changes it may produce and the effect of such changes on other organs. As the cure must depend upon the removal of the cause, he must know what effect the removal of that cause will have upon the individual. If this is not understood, the animal may suffer needless pain and inconvenience. When these things have been carefully considered and the competent surgeon has reached a conclusion that a certain operation is necessary for the good of the animal and welfare of its human owner, he should then have the firmness of purpose to carry out that operation to its complete

termination. The owner should be fully acquainted with every possible danger, and when he with this knowledge consents to the operation, the case should be fully in the hands of the surgeon who should enforce his rights to complete the operation regardless of the whims of the owner. A steady nerve, deliberate action, exactness of location and precision as to methods are all essential.

The surgeon should be an untiring worker. No matter how well one has mastered his anatomy, physiology, pathology, bacteriology, etc., unless the memory is often refreshed, that clearness of relation so essential to successful surgical procedure is lost. The laboratory offers the best opportunities for this much needed review, but it is not the only opportunity. I fear too few of our practitioners of veterinary medicine and surgery, either general or special, avail themselves of the almost unlimited opportunity offered for careful autopsies.

How many of our brothers practicing human surgery would consider the opportunities of holding autopsies that we neglect as most favorable for their advancement, did not law and custom prevent? Not only are we thus privileged to ascertain the pathological lesions that caused the death, but to refresh our minds on the normal structure as well. These are not all the advantages which are at our pleasure for we are favored with an almost unlimited opportunity to practice the various surgical operations on the cadaver.

Someone has said in discussing the training of the human surgeon " that the boy so destined should be taught the principles of evolution, natural science, the general laws of plant and animal life, and especially comparative zoology, elementary physics and chemistry, and at the same time his hand should be trained by animal dissection." In addition to his school, college and hospital training, he should have several years' experience as a general practitioner, as the importance of correct diagnosis in surgery cannot be overestimated. This is true in veterinary surgery as well as in human practice. There is perhaps no better way to become familiar with pathology and morbid anatomy than in the general practice of medicine, particularly is this true if the autopsy is not neglected.

We are told that " Cleanliness is akin to Godliness." Surely nowhere is this more true than in surgery. Perfect cleanliness is so closely related to asepsis that the mentioning of one causes one to think of the other. If perfect asepsis is maintained throughout the operation and subsequent treatment, little short of destruction of vital organs is likely to produce death.

A great deal of truth is contained in the statement that " antiseptic surgery is largely a matter of habit." If a man is untidy and careless about his person, clothing and habits, when not engaged in operations, he will not be likely to make the radical changes necessary to be clean during such operations. If one fails to observe asepsis in minor things, he will scarcely be able to apply it to the major ones.

An uncontrolled temper is a great detriment to the veterinarian. Many things in the handling of animals tend to irritate and provoke outbursts of temper on the part of the surgeon. When not controlled these seriously interfere with subduing the animal, rendering the operator nervous and unfit for his task as well as displeasing all present.

Temperate habits are also essential. He who indulges in strong drink to excess should never be trusted with the surgeon's knife. Overindulgence in anything that tends to lower the vital forces soon undermines the health, wrecks the nervous system, and renders the individual unfit for any service, especially for a surgeon.

" The final making of the surgeon is of three parts; viz., first, experience; second, experience, and third, experience." Specialization in the practice of medicine and surgery is fast growing in popularity. The one who does the same thing over and over, day in and day out, year after year, must surely become more proficient than the one who only does it occasionally. The ideal can seldom or never be attained, but the nearer we approach to it the better.

Some operations require the cultivation of some one or more of the special senses, as, for example, the castration of the equine cryptorchid requires a well-developed sense of touch, which is at-

tained in a high degree only by frequently performing this operation. The clear thinker, who has had long and careful experience, preceded by sound education, bases his conclusion on the broadest possible knowledge and if he has developed a high degree of manual dexterity, he will come the nearest being our ideal surgeon.

The veterinarian should understand his legal as well as his moral obligations to his client. It is well to know what to do, but often better to know what not to do. Malpractice not only consists in doing the wrong thing, but often in neglecting to do the right thing. The surgeon is not responsible for a failure to cure if he follows the prescribed methods and uses reasonable precaution. Animals to be operated upon must be restrained and such efforts are always subject to accidents for which the operator is neither morally nor legally responsible if he has used reasonable care and precaution. New and untried methods in the practice of veterinary medicine and surgery should be tried carefully, remembering that not only one, but sometimes many tests are necessary to prove efficiency. It is in the use of the new methods that we often take the greatest risk. This might be due to a lack of familiarity with the thing or the method. Again, we might be liable for malpractice because we failed to use the comparatively new methods, provided they had been used enough in general practice to prove their worth.

To illustrate the surgeon's legal responsibility I will quote from the opinion of the Supreme Court of Colorado rendered in a case of surgery on the human kind that would seem to apply equally as well to veterinary practice.

" In the absence of a special contract the law implies that the surgeon employed to treat an injury contracts with his patient (client) :

> " First—That he possesses that reasonable degree of learning and skill which is ordinarily possessed by others of the profession.
>
> " Second—That he will use reasonable and ordinary care and diligence in the exercise of his skill and the appli-

cation of his knowledge to accomplish the purpose for which he is employed, and

"Third—That he will use his best judgment in the application of his skill in determining the nature of the injury and the best mode of treatment. He is not responsible for want of success unless it results from a failure to exercise ordinary care, or from want of ordinary skill. If he possesses ordinary skill and exercises ordinary care in applying it, he is not responsible for a mistake of judgment."

From the foregoing opinion it will be seen that the legal as well as moral requirements are not for impossible things, but rather than one possess all the knowledge and skill he claims to possess, that he use reasonable energy and diligence in applying the same to the end that he does his whole duty to his patient and his client, and honor to himself and his profession.

Dr. Kaupp Leaves Colorado—Dr. B. F. Kaupp severed his connection with the Colorado Agricultural College on November 1, and after a vacation of two weeks spent in Texas and Missouri, reported to the Abbott Alkaloidal Company in Chicago as per previous arrangement.

Dr. Kaupp's work will be that of research pathologist for the Abbott company, a work for which he is eminently qualified by training and experience.

Dr. Glover expresses regret in the loss of Dr. Kaupp, who has for over four years manifested a more than common zeal and devotion for his work in Colorado.

We congratulate the Abbott Alkaloidal Company in securing the services of Dr. Kaupp and we also congratulate Dr. Kaupp in that he is now enabled to devote his entire time to a work for which he is especially adapted.

Dr. I. E. Newson, who has been in charge of the department of anatomy at the Colorado Agricultural College for the past four years, has taken the place made vacant by the resignation of Dr. B. F. Kaupp. Dr. A. W. Whitehouse will have charge of Dr. Newson's classes for the balance of this year.

HOG CHOLERA IN MANITOBA.*

By C. D. McGilvray, M.D.V., Winnipeg, Canada.

The occurrence of hog cholera in urban and suburban districts in certain sections of Canada, and the non-appearance of the disease in the rural districts, has shown a striking connection between such outbreaks and the feeding of swine upon uncooked kitchen refuse and garbage and points strongly to such material being a medium conveying infection and starting fresh outbreaks.

In the province of Manitoba, with the conditions of which I am familiar, hog cholera has only made its appearance on rare occasions. Dunbar reported an outbreak which occurred in the vicinity of Winnipeg during 1886 and Stevenson an outbreak near Carman in 1899.

Since the latter time it has not made its appearance until August, 1911, when it was found to be in existence among pigs kept on premises in the district immediately surrounding the city of Winnipeg.

Almost simultaneously with the outbreak at Winnipeg, other outbreaks were reported in the vicinity of certain other urban centres in Western Canada.

Efforts were immediately directed toward the control and eradication of the disease from these districts and to ascertain and determine the source of infection.

Searching inquiry failed to bring forth any evidence or information as to the infection having been introduced by fresh hogs brought into such districts and no possible history was obtainable of the infection having been thus introduced.

A rather curious and striking feature was that on all premises upon which the disease first manifested itself, the hogs thereon were being fed upon uncooked swill, kitchen refuse and garbage

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obtained from hotels and restaurants. On other premises, in the same districts, where the hogs were not being fed upon kitchen refuse and garbage, the hogs were found to be healthy, and remained so unless, and until, becoming infected by either direct, or indirect contact, or intermediary means from premises where the disease had already manifested itself. In the latter cases information was obtainable that infection had been introduced by such means.

Dr. J. G. Rutherford, late Veterinary Director General for Canada, in his report for the year 1910 refers to the possibility of outbeaks of hog cholera being started in suburban districts among swine being fed on uncooked garbage. Our experience and observations in connection with outbreaks of the disease dealt with in Western Canada strongly indicates and supports the theory as to fresh outbreaks originating in many cases from such sources.

The outbreaks dealt with by us in the district surrounding the city of Winnipeg furnished strong circumstantial evidence in support of this theory, while other outbreaks subsequently dealt with at Kenora, Rainy River and Fort Frances in Western Ontario furnished even more striking illustration and convincing proof thereof.

In connection with the outbreak at Winnipeg, which was of a serious nature and of large extent, we found the disease to be in existence on 62 premises. In order to eradicate the disease it was necessary to slaughter 2,219 swine which were acutally diseased or had been in close contact with diseased pigs, during a period extending from September to December, inclusive.

During this time we also visited an additional 212 premises and inspected thereon 2,190 pigs, which were kept under close observation and inspected again at regular intervals covering a period of three months.

In the case of the outbreak at Kenora, it was reported to us, during October last, that some disease was causing serious losses among hogs on the premises of a Mr. H———. Upon investigation it was found that the owner of these hogs conducted a

hotel at Kenora and was feeding the swill and kitchen refuse from the hotel to hogs being kept on his farm premises some five miles distant.

The symptoms shown by these hogs, as well as post-mortem lesions, were characteristic of hog cholera. No fresh hogs had been introduced on the premises for over one year prior to the time of the outbreak and there was no apparent possibility of them having come into contact with any other hogs for a like period.

Hogs were also found to be affected on three other premises which were separate from each other by several miles, and upon which the swine were being fed uncooked swill or kitchen refuse obtained from the hotels in Kenora.

The disease manifested itself on these premises almost simultaneously, without any possibility of infection having been introduced, either by direct or intermediary means, or any other source determinable.

On further examination of all premises upon which hogs were being kept in the vicinity of Kenora, which were kept under observation and inspected at regular intervals, covering a period of over three months, it was found that the disease only existed on premises upon which the hogs were being fed uncooked kitchen refuse or garbage, or on premises where garbage fed hogs had been introduced.

Of the outbreak in Kenora, on four premises 146 garbage fed hogs were found to be affected. On two other premises, on which the disease was found to be in existence among 17 hogs, the source of infection was traceable to the introduction on to the premises of hogs which had been obtained from one of the parties whose hogs were being fed on hotel kitchen refuse. The hogs which were thus obtained were the first to show evidence of the disease and the history obtained was that the other hogs on the premises had been entirely healthy until the introduction of the hogs referred to.

Hogs were also inspected at 13 other premises in the district of Kenora, which had not been fed upon uncooked garbage and

were kept under close observation for a period of three months, and again subsequently inspected after a further period of six months and remained entirely healthy.

Needless to state during this period, due precautions were exercised to prevent any possible infection being introduced from any infected premises.

Our experiences in dealing with the outbreaks in districts surrounding the city of Winnipeg were similar to those at Kenora. The disease first manifested itself on premises on which the hogs were being fed uncooked kitchen refuse and garbage and then spread from such centres to other premises in the same district. The history in all cases was so convincing as not to be lightly overlooked.

During the month of July of the present year, outbreaks of hog cholera were reported as occurring at urban points in the Western portion of Ontario, at Fort Frances and Rainy River, and, upon investigation, some rather interesting features were observed.

A careful inspection was made of all premises in the districts upon which hogs were being kept. In all 82 premises were inspected with the following results:

On 59 premises, 345 hogs were inspected which were not being fed on uncooked swill or kitchen refuse. These were found to be healthy at time of examination and showed no evidence of disease.

On two premises, upon which the hogs were not being fed uncooked kitchen refuse, the disease was found to be in existence. In these two cases, however, history was obtainable of the infection having been introduced by animals obtained from other premises where hog cholera was detected.

On 21 premises we found that the hogs thereon were being fed uncooked swill and kitchen refuse obtained from hotels and restaurants. On 10 of these premises we found the disease to be in existence, 58 pigs were found to be affected, while 60 others had died a short time prior to inspection. On the remaining 11 premises, upon which were kept 77 hogs, the disease was not in evidence at the time of inspection.

It will, therefore, be seen that out of 21 premises upon which hogs were being fed uncooked kitchen refuse and garbage, cholera was found to be in existence on 10 of these, while on 61 premises, upon which hogs were not being fed such refuse and garbage, the disease was only found to be in existence upon two premises and, in each case, a history was obtainable of the infection having been introduced by hogs coming from premises upon which they were being fed garbage and the disease had manifested itself.

Close inquiry was made in connection with all of these outbreaks as to the possibility of the infection having been introduced by other hogs having been brought into the districts, but no information was available indicating such a source of infection.

The question might arise as to why the feeding of hogs upon uncooked kitchen refuse and garbage may give rise to the disease. In this connection it was invariably found by us that hotel refuse and kitchen garbage being fed to hogs contained quantities of pork products, especially pork cuttings and sausage.

In connection with our investigations as to the possible source of infection, we directed inquiry as to where many of the hotels and restaurants (from which was obtained the garbage being fed to hogs) had procured their supplies of pork products. As a result of our enquiries it was invariably found that these products were of a similar brand and origin, being obtained from the same firm which imports very large quantities of American pork products. It was also observed that coincident with the appearance of these outbreaks, large quantities of pork products were being imported by this firm. The distribution of these products to certain widely separated points was followed almost simultaneously, or in rapid succession thereafter, by outbreaks of the disease. It would, therefore, appear quite probable that the meats in question had been infected.

The disease appeared in both the acute and chronic types, and the symptoms and post-mortem lesions were characteristic of the disease. At the beginning of the outbreak the acute type was most in evidence and more marked in severity, becoming less so with the lapse of time. This no doubt depending upon the viru-

lence of type or strain of infection appearing to become weakened or attenuated with the lapse of time.

The characteristic symptoms in evidence were: Sluggishness, capricious appetite; gumming or adhesion of the eyelids; accelerated breathing, associated with cough in some cases; the appearance of reddened or purplish blotches on the skin, especially around the region of the ears and neck and the under surface of the abdomen and inner thighs. The bowels in some cases were constipated, while in others diarrhœa was present. Progressive weakness, uncertain gait, terminating in loss of power of the hind limbs, was frequently noticeable.

In the acute cases the animals rapidly succumbed to the diseases, hogs ranging from two to six months in age seemed to be more severely affected and more rapidly succumb than those older. In the chronic cases, as the course of the disease became prolonged, progressive weakness and emaciation supervened.

Post-mortem lesions were chiefly in evidence affecting the lymphatic glands, lungs, heart, kidneys, spleen and intestines. The lymphatic glands were usually observed to be markedly reddened and enlarged. The lungs showed many small ecchymosis and large pneumonic areas, dark red in color, consolidated, and sharply defined from the healthy lung. Ecchymosis was also observed on the heart surface. The kidneys were usually darker in color than normal and presented numerous petechia (turkey egg appearance). The spleen in many cases was greatly enlarged, although in a few cases, it appeared smaller than usual. Where the disease had been of short duration, as in acute cases, petechia and ecchymosis were noticed on the outer surface of the intestines and on the inner surface areas of the mucosæ often appeared congested, inflamed and more or less swollen.

In chronic cases somewhat similar lesions were observed as in acute cases, together with the characteristic ulceration of the intestines, noticeably around the region of the ileo-cæcal valve, as well also as thickening of the mucosæ in other parts of the intestines.

Reference has been made to a serious affection of swine other

than hog cholera, although simulating that disease, as a result of them being fed on kitchen refuse containing certain alkalies.

No doubt the feeding of such refuse containing certain alkalies may be harmful and the cause of serious affections and losses among pigs. However, any affection caused by such alkalies would not be of a contagious nature as was the case in the outbreaks herein referred to, which were essentially highly contagious and characteristic of hog cholera.

The result of our investigations and inquiries showed a close and striking connection between the existence of the disease and the nature of the feeding, furnishing very strong circumstantial evidence in support of the belief that many fresh outbreaks of hog cholera are started in urban and suburban districts by feeding hogs upon uncooked kitchen refuse and garbage containing infected pork or pork products.

Beginning with the session of 1914-15 the entrance requirements at the School of Veterinary Medicine at the University of Pennsylvania will be two years of high school work, covering at least eight units as follows: English at least 2, algebra at least 2, history 1, other subjects 3. Candidates for admission who cannot present high school certificates will be required to pass examinations in English, algebra, history, physics and one language, French, German or Latin.

Dr. McGilvray Receives Appointment.—We learn from the *Farmers' Advocate and Home Journal*, Winnipeg, that Dr. C. D. McGilvray has been appointed to succeed Dr. Fred Torrance as head of the Veterinary Science Department of Manitoba Agricultural College. Born in Glasgow, Scotland, he came to Canada in his boyhood days. His veterinary training was received at Toronto, with a post-graduate course at Chicago. He has been in the Canadian West for 26 years, having practised in the Binscarth district before taking the position of representative of the Dominion Veterinary Branch at Winnipeg in 1905. Being acquainted with the West and having a thorough knowledge of all branches of veterinary work, he is a good successor to Dr. Torrance, now Veterinary Director-General at Ottawa.

STIFLE LAMENESS.*

By David W. Cochran, D.V.S., New York, N. Y.

Gentlemen. At the request of the chairman of the Committee on Practice (Dr. H. D. Gill), I have prepared a paper to be read and discussed at this meeting.

The subject which I have chosen is on lameness associated with pathological conditions of the femero-tibial-patella articulation, commonly called the stifle joint; the lameness being a symptom or manifestation of some physical lesion, either isolated or complicated, affecting one or several parts of this apparatus.

I know of no subject in veterinary literature of which there is so much diversity of opinion. It is a condition which presents many variations, due to its anatomical complexity. It is formed by the articular surfaces of three bones, forming two distinct joints, the femero-pattella, and the femero-tibial. They form an imperfect hinge joint, while the patella itself offers the greatest movement of any bone, in the whole body. This joint is strengthened through the medium of inter-articular meniscus, a fibro fatty cushion, inter-articular, and surrounding funicular ligaments, together with the insertion of tendons of muscles, surrounding the parts reinforcing these bands.

Diseases affecting this joint do not offer any classification, but for general purposes a division may be made as follows: 1. Dropsical, 2. Nervous, 3. Arthritic, 4. Traumatic, 5. Spasmodic, 6. To diseased conditions of Boney Structure.

Under the Division of Dropsical Conditions.—There is a hydrarthrosis or hydrops-Artisculorum. This is an effusion of a fluid into the joint; it exists without the symptoms of inflamatory process being present. It is in reality, however, associated with some structural change within the lining membrane of the joint. This articulation is supplied with three synovial capsules,

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one to the femur and patella, and two others connecting the condyles of the femur and the facets of the tibia. The dilatation of these capsules forms a soft tumor. It rarely causes any lameness except when it assumes large proportions. Then there may be limited motion of the Stifle, or we may also have a *hygroma,* a serious bursa or cyst.

It is sometimes hard to differentiate between a pre-patela hygroma and a femero-tibial patela-hydrarthrosis, as both may exist together.

The *hygroma* may deform the parts, but seldom produces any lameness or inconvenience to the animal.

The Nervous Lesions.—That condition exists which may be pathognomonic, as well as the sequalæ of azoturna, where in one case we have it results in loss of power, and in the other an atrophy of muscles about the stifle joint, due to suspended innervation.

There is a great loss of function in which no treatment, whether external or internal seems to be of any benefit. Exercise of own volition by the animals at pasture gives favorable results.

The Arthritic Form.—Under this heading, I will mention gonlitis. This diseased condition is characterized by chronic inflammation, and by degenerative changes involving the structure of the articulation and resulting in rigidity and atrophy of the muscles attached from the external angle of the illeum to the femero-tibula-patella articulation.

The tensor vaginæ is very tense and rigid. The stifle is very prominent. This condition may be unilateral or bilateral. In the unilateral form, the horse stands with the limb flexed, does not care to support the body weight on it, stands with the pastern in extreme flexion, the anterior face of the foot rests on the ground surface, the plantar surface is exposed, he often holds his foot clear from the ground. This hoof is smaller than its fellow. There is a drying out of the foot, a closing in of its sides, the heels growing high, the shoe is well worn at the toe.

In the bilateral form, there is uneasiness in both legs, a con-

stant shifting from one foot to the other, the foot is alternately held free from the ground surface, the back arched, accompanied by atrophy of the muscles of the patela region. When started off his movements are short and stilty; the motion of the stifles are limited.

Horses affected with gonlitis are very hard horses to shoe. In the unilateral type, we start by shoeing the lame leg. The hoof is brought as near as possible to the shape of a normal foot. The foot is shod with a shoe elevated at the heel; the toe of the shoe is flat. The application of the shoe to the foot is accompanied with a leather sole, tar and oakum packing, to keep the foot moist and to prevent drying out. The trouble now commences when the foot of the sound leg is to be shod. The shoer will have to lift this leg with main strength and hold it. When he has it up from the ground surface, very often the horse will not stand on the lame leg. The whole weight of the horse is on the shoer's back, the lame leg is suspended in the air. If the shoer attempts to shift the weight, the horse will in most cases fall on the floor.

In the bilateral form, we have this trouble with both legs. The treatment of these cases are counter irritants, either vesicants setons or the actual cautery. Some horses get sound temporarily. Some not at all. Results are not always favorable.

In a post mortem of one of these cases, there was found blood stained synovia, partly coagulated. The cartilage of the patela was discolored, but smooth. The condyles and the trochlea were arthritic, with some eroseons and small exastoses, on the external condyle.

The Traumatic Form.—Traumatism is just as liable to this joint as any other in the horse. Sprains and wounds must appear occasionally. Here there may be a true luxation of the patella as the result of an injury due to accidental causes. The displacement of the patella may be the result of laceration of ligamentous structure, or an elongation of ligamentous structure. I have seen horses with elongated tendinous structure and at each step taken, there could be heard distinctly a clucking sound.

Another form of traumatism to which I would principally call your attention is rupture of the cord of the flexor-metatarsi. It has its origin at the inferior extremity of the femur in the fossa, excavated between the trochlea and the external condyle, and terminates in two branches. A large one lies in front and is attached to the superior portion of the principal metatarsus, the other deviates outward and is attached to the anterior surface of the cuboid bone.

This rupture is due to a violent effort on the part of the animal either to move a heavy load or to a powerful struggle to avoid a threatening fall. The symptoms are, the animal walks with difficulty, the leg hangs on the hock, and there is a buckling of the tendo achillis in extension, no flexion at the hock. In motion the leg is drawn upward and backward.

The rupture of the premetatarsal may take place at various points of its length. Sometimes at its femoral insertion or at its metatarsal insertion. When the rupture of the cord takes place in the tibial region, the ends immobilized by muscular layers between which they are enclosed, readily cicatrize. Where it takes place at the superior extremity, it is a more serious case; in order to effect a cure the parts must be made immobile. We must try to prevent motion in order to hasten cicatrization.

If an animal thus affected is forced to walk, the femero-metatarsal cord not transmitting to the canon bone the flexion of the femur, there is a loss of function. The canon bone is not flexed but hangs powerless. The phalangeal column hangs vertical. The tendo achillis, no longer subject to the counter action of the flexor muscles, is flabby and bent towards its insertion on the os calcis. There is a loss of co-ordination and the leg dangles from the hock, if compelled to move. When at rest the aspect is changed; no matter how serious the symptoms while walking, they now have changed. The leg which a moment ago was powerless, now participates in support of the body weight, with the foot solid on the ground surface.

Treatment.—Secure immobility, apply counter irritation at the superior and inferior extremity of the cord. Absolute rest. Prognosis favorable.

The Spasmodic Form.—Cramp, is defined as a spasmodic, tonic contraction of muscles. The etiology of cramp is obscure. There is much diversity of opinion as to the exact cause. It is generally admitted that it may result from muscular, nervous, or vascular lesions, although most of the observations reported in veterinary literature under the title of cramp relate to a "pseudo luxation of the patella." I have seen horses with cramp of the muscles of the anterior extremity.

The symptoms of pseudo luxation of the patella are shown when an attempt is made to back the horse from his stall. He refuses to budge. When forced to back, one foot seems fixed to the floor, the leg is rigid. If moved forward, the leg, still rigid, drags along behind its fellow on the anterior face of the hoof. The plantar surface is exposed and turned backward. All joints in this leg are flexed, except the hip. When compelled to walk in this condition, movement is accomplished with exertions and great distress. It occurs in the standing animal only, and can only be discovered when forced to move.

The Primary Lesion.—The location and the manner in which this articulation is so effectually locked, is a subject of much diversity of opinion.

Causes.—The causes of pseudo luxation of the patella are generally obscure. It often follows in horses that have been laid up on account of some debilitating disease. It comes as the sequelæ of a long rest. Some authorities contend there is a luxation outward, some inward, some contend that it is a fixation of the patella caused by cramp of the muscles, which are focused to the tendinous attachments to the patella. Others say that this dislocation is due to the anchoring of the patella upon the upper end of the internal hip of the femoral trochlea, the part being well fitted by its peculiar formation to prevent the patella from sliding back over the rim. It becomes fixed in its new position by the irregular and violent contraction of the muscles involved in the abnormal tension.

It seems impossible that such a state of rigidity can exist, as in some cases for a few hours, and in others for days, yet in

none of these cases do we ever find any inflammation as a sequelæ, or any pathological change, in any part of this joint.

Treatment.—If we agitate this animal with a whip or go through any manual procedure, either massage or pressing the patella in and out or up and down, by drawing the leg forward with a side line or by the application of a stimulating liniment along the course of the tendo achillis, the symptoms disappear. We never see it in a horse at work, no matter how hard the labor. Some practitioners resort to a surgical treatment, that of desotomy of the internal patella-tibial ligament, known as the *Bassi operation;* others to a resection of the Triceps Femoris at their lower border. Good results are recorded.

This surgical procedure seems to be the inverse of any physiological or mechanical theory. The patella normally lies above the condyles of the femur when the femero-tibula joint is extended; and during flexion, it lies in the inter-condyloid fossa, more on the external than upon the inner. If these surgical operations are right and give immediate results, what will be the results when these ligaments have again united?

Dr. W. L. Williams on this subject has shown with the aid of a mechanical appliance, by which the patella was made stationary above the internal lip of the trochlea, that we do not get extension backward, but extension forward.

Diseased Condition of the Bony Structure.—In young animals of rachitic diathesis, there is a tendency to luxation of the patella. A predisposing cause being softening of the bones from impaired nutrition, there is a spongoid condition resembling decalcified bone. The periosteum stretches very easily, it becomes thick and inflammatory due to strains of ligaments.

There are diseases of osseus structure in horses of advanced age, namely, that of osteomalacia, and osteoporosis. We have in these forms also strains of ligamentous structure on the periosteum, causing inflammation and swelling and elongation of tendons. These conditions are often confined to certain districts, and arise from malnutrition or bad hygienic surroundings. A change of diet and good hygienic conditions favor recovery.

In conclusion, I wish to give credit for many of the references in this paper to *Chaveau's Anatomy, Dr. Liautard's articles on lameness,* and also to the very elaborate papers on this subject by *Dr. W. L. Williams* and *Drs. L. A.* and *E. Merrillat,* which were published in the AMERICAN VETERINARY REVIEW.

"BEAT IOWA" was the slogan of the Iowa State College at Ames, referring to the football game that was to be played between that college and the Iowa State University, on the college campus at Ames, Saturday, November 16 last; and that the contest was waged purely in the spirit and for the purpose for which it was intended (*i. e.,* to stimulate athletic training), is evidenced by the sportsmanlike sentiments expressed in a letter from Mr. Crittenden Ross, student of the School of Veterinary Medicine, from which we have taken the liberty to quote without Mr. Ross' knowledge or consent, and trust we will be pardoned for doing so. Mr. Ross says: "The score was Iowa 20, Ames 7, after a hard fought battle. Our boys were not equal to the occasion; and, although it grieves us somewhat, I believe that Iowa earned the game." Those are manly sentiments, and we predict a "future" for their author, and to whatever heights he may attain, he will reach them by honorable methods and honest competition.

THE TENNESSEE VETERINARY MEDICAL ASSOCIATION held a most interesting meeting at Morrill Hall, University of Tennessee, Knoxville, Wednesday and Thursday, November 20-21. Among the interesting educational features was an illustrated lecture by Prof. E. C. Cotton, Assistant Entomologist of the Agricultural Experiment Station, on the "Life History of Southern Cattle Fever Tick" and "Sex Determination" by Prof. A. A. Schaefer, Assistant Professor of Zoology, University of Tennessee, also illustrated. The clinic at the hospital of Drs. Jacob and Shaw and the visit to the University Farm under the direction of Prof. C. A. Wilson, of the Animal Husbandry Branch, were very much appreciated.

AN ARTICLE ON EPIZOOTIC EQUINE ENCEPHALO-MYELITIS (Borna Disease) by Prof. C. H. Stange, Dean of Division of Veterinary Medicine, Iowa State College, will be published in our January issue.

THE VETERINARY SERVICE IN THE PHILIPPINES.*

By Archibald R. Ward, Chief Veterinarian, Bureau of Agriculture, Government of the Philippine Islands.

In the Review for January, 1912, on page 542, there appears a report of Special Committee on Insular Possessions (A.V.M.A.), signed by Dr. N. S. Mayo, Chairman. The same report is published in the Proceedings of the American Veterinary Medical Association for 1911, with my name along with those of other members of the Committee. Inasmuch as I am the only representative on the Committee from these Islands, it might well be inferred by the reader that I share responsibility for the opinions expressed. As a matter of fact I was not privileged to contribute to the report nor comment upon the same before publication.

The report emphasizes conditions in the Philippines, and I infer that it specifically deals with matters here, for I know of no other Insular Veterinary Service, outside of that in Hawaii, which consists of not over half a dozen veterinarians. In any event I shall comment upon the recommendations of the report so far as the proposed scheme would affect the largest Insular Veterinary Service in the possessions of the United States.

I dissent from the opinion that there is small inducement for entering the Insular Service here. The pay was described as not large. The Veterinary Division of the Bureau of Agriculture starts in men at $1,600 per annum, and there are twenty-three positions carrying this salary. Opportunities for promotions exist in the form of fifteen positions carrying $1,800, seven at $2,000, three at $2,250, two at $2,500, and one at $4,000.

Besides receiving half pay during the time consumed in traveling to the Philippine Islands, and reimbursement for traveling expenses en route, employees receive twenty-eight days a year

* This article was received in the Review office about the last week in April, 1912, and delay in publication until this time was entirely unintentional, it having gotten in some way mislaid at the time of its receipt and has just turned up.

for vacation or sick leave together with thirty days a year of accrued leave to be spent out of the Islands, all on full pay, and travel across the Pacific is not counted against this leave. Besides this, traveling expenses and subsistence are paid by the Government when men are away from official station, and it is safe to state that most of the men live at Government expense three-quarters of the time. The veterinarians of the Bureau of Agriculture receive on an average six hundred dollars a year reimbursement for travel, subsistence and lodging. The financial inducement for well-educated veterinarians to enter the service here is, in my estimation, liberal.

The Committee report states that "promotion is slow, and there is little of it." In this connection I have examined the records of promotion of all men in active service with the Veterinary Division of the Bureau of Agriculture on July 1, 1910, and since that date. During the period covered by the services of these men, two have advanced from $1,600 to $2,500 in an average period of two years and ten months, two to $2,250 in two years and seven months, nine to $2,000 in two years and three months, and eighteen to $1,800 in one year and nine months. Five have left the service after an average period of two years and three months without earning promotion. Fifteen men are serving at present at a salary of $1,600, and among these the eldest in the service has been in the employ of the Government for two years and ten months. Thirteen of these have served less than sixteen months.

Let us compare these conditions with those obtaining in other veterinary organizations with which we are all familiar. In the Bureau of Animal Industry a veterinarian is appointed at $1,400 a year. His residence may be New York, and he may be ordered to report at San Francisco, paying his own expenses, and his salary begins only when he reports for duty. The best that he can hope to do is to obtain an increase after two years' service, but, as a matter of fact, these promotions have been deferred for lack of funds. Employees receive fifteen days each of annual and sick leave on full pay.

Former Quartermaster's Department veterinarians have given me the following information: Veterinarians in the Quarmaster's Department of the Army are appointed at $1,200 per annum, with no allowances except when traveling, and there is no increase in pay nor retirement. Single men sometimes receive quarters, but this is not the rule. Commissary privilege with ten per cent. increase is allowed, but this is of little benefit to a single man.

Army veterinarians undoubtedly receive more salary and perquisites than those in the Philippine Civil Service. The disadvantages of the Army Veterinary Service have been put before the attention of the profession by writers more familiar with the facts than myself.

The statement is made that "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."

This is certainly an alarming condition if true. In connection with this matter I have scrutinized the annual report of the Bureau of Health for the Philippine Islands, for the year 1911, for verification of the assertions. This Bureau is directed by an officer of the United States Public Health and Marine Hospital Service, a fact that guarantees the authenticity of figures regarding health conditions here. I find that the death rate for Americans in the Government employ throughout the Islands is 8.87 per 1,000 for all causes, and the average age at death 32 years. The death rate in the states included in the registration area of the United States, is 16.4 per 1,000. The exceedingly low death rate in the Philippines is due to the fact that Americans in the Government employ are young men. The death rate, considering their age, is similar to that in temperate climates. I find that in Pennsylvania, in 1907, the death rate for ages 25 to 34 was 7.9 per 1,000, and in Liverpool, England, for 1909, for ages 30 to 40 was exactly the same. There is no justification afforded by mortality statistics or my personal observation to warrant alarming statements about any infections characterized by febrile symptoms, for I am not certain what disease is meant by the expression "the grim destroyer, fever."

With reference to petty local politics, I believe that the veterinarians in the Philippines are as free from this sort of influence as in similar work elsewhere. Live stock owners in the Philippines are as ready to protest against and evade quarantine as are stock owners in the United States. However, this attitude has no influence in restraining the Bureau of Agriculture from carrying out a policy considered appropriate for existing conditions.

The report recommends that the Insular veterinarians should belong to the Army, inasmuch as our Insular possessions are administered by the War Department. This reason might be advanced for placing in the United States Army Justices of the Supreme Court of the Philippine Islands or any other civil government employee.

The proposal to turn over the control of veterinary matters in our Insular possessions to the Army suggests a number of queries. Would Congress alter its policy of not spending money on the civil government here? At present the Philippines cost the United States nothing for civil administration, and any change would involve far-reaching consequences.

The report states "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." Ignoring the inference that our present corps does not possess the desirable qualifications first enumerated above, I should like to know where in the United States there could be obtained men trained "particularly in regard to tropical diseases of animals" with or without a modern language. The Bureau of Agriculture of the Government of the Philippine Islands has trained "a few veterinarians in the long, hard school of experience to deal with tropical animal diseases in an intelligent manner." This has been necessary because no men so trained were to be had in the United States.

The establishment here of the College of Veterinary Science of the University of the Philippines will in time relieve the situa-

tion. The entrance requirements necessitate graduation from a Philippine high school requiring four years of work, and the veterinary curriculum embraces five years of nine months each. This standard is equivalent to requiring an American high school education and four years of veterinary instruction for graduation.

The proposal to link with an invading Army organization a veterinary corps for the protection of the live stock of the occupied country is an altruistic conception quite beyond the present stage of the usages of war. As a matter of fact, the protection of live stock can receive attention only after pacification.

The duties of the members of this corps are described as that of "protection of the Army horses and also the live stock of the occupied country." This is a rather ambitious program. If he is an Army veterinarian, how can he remain and give the country the benefit of his expert services "after the need for an Army has passed?"

What reason is there for the assumption that there is no definite central supervision at present, and what basis is there for the belief that this would be improved under the Army? Certainly the status of the Army veterinarians today does not warrant it. By their own testimony, a chief veterinarian is one of their imperative needs as a means for putting "the Army veterinary service on a professional, effective and economic basis."

The desirability of a tour of service at home is suggested. How would these men be employed? There are positions for forty-four of them now in the employ of the Government of the Philippine Islands, more than in the Army. The accrued leave system in force here at present abundantly provides for extended vacation at home.

The report shows that it was prepared without the advantage of all of the sources of information available and probably at the eleventh hour.

COMMITTEE MEETING fiftieth anniversary, A. V. M. A., was held November 30.

NEW YORK'S EQUINE PLAGUE.*

By Louis Griessman, D.V.S., New York, N. Y.

In reading the Old Testament one will come across texts on disease, and among them is mentioned glanders. This disease, in the days before Christ, is described in Hebrew as Saüs Hötem Luöfen, translated, means horse with a discharge from the nose. Abraham, who was the possessor of numerous live stock, mentions the death of horses by this form of plague.

In the fourth century, Apsyrtus describes one form of glanders (Farcy) as Elephantiasis. And in the fifth century, Vegetius mentions this disease, until we get to the thirteenth century, when Rufus gives a fair history and some symptoms. In the fifteenth century Ruini also writes about glanders, and in the sixteenth century a quaint old German by the name of Winter Von Adler Flugel had a queer idea concerning this disease. His idea was that there were two forms "white" or "stone glanders," which, in his opinion, was curable, and "yellow," which gave forth an offensive odor and incurable.

From the sixteenth to the eighteenth century numerous writers and investigators wrote on this subject, and in the nineteenth century Schutz and Loeffler, who investigated glanders, found the *bacterium mallei.*

Nature of the Disease.—In the strict sense of the word it is a contagious disease, and it is necessary that both the profession as well as the public have an exact idea of its character, under what conditions it exists, the source of infection, its spread, and most important, the sanitation and prevention. A contagious disease is one which finds its origin within the organism of a given animal species, and extends from such an infected animal to other animals of the same species, or to animals of other species which possess more or less susceptibility to infection.

* Presented to the Veterinary Medical Association of New York City, at its November, 1912, meeting.

Glanders occurs in the horse, ass, mule, and is transmissible to man and all domestic animals, except the cow; still sheep and goats have been found to be infected where they were kept in the same stable with diseased horses. The disease has been produced by inoculation in dogs, cats, prairie-dogs, white bears, lions, mice, guinea-pigs and rabbits.

Glanders may be spoken of as acute or chronic, according to the seat of same, as nasal, pulmonary, cutaneous and lymphatic. Acute glanders may terminate in fifteen days, while the chronic form may continue for years. Dieckerhoff reports a case which existed for a period of seven years. The chronic or latent form of glanders, in my opinion, is more dangerous, while in acute glanders it is very often recognized by the horse owner and is clearly manifested.

Manner of Infection.—May be directly or indirectly, by means of harness, blankets, watering pails, fodder, stable flies, wounds, digestive tract or respiration. The last two are the most frequent ways of infection, and we must bear in mind the great public nuisance—the watering trough. This nuisance by all means should be abolished and some sanitary method advocated in its stead. The return to the old water pump would be better, where each driver would use his own pail. It is a known fact that the glander bacilli is found in the dirty watering trough, due to the infecting nasal discharge from glandered horses, while the activity of the germ can be retained for a period of one to three weeks.

This disease is common among horses that are kept in narrow, damp, ill-ventilated stalls in basements or cellars, yet is found to occur in the best hygienic stables; also in old wooden shanties, where the walls are saturated and no sewer connection. All these conditions do not help to prevent the disease, but increase same. Proper legislation would be the means of abolishing these infected cellar stables.

It is a known bacteriological fact that the bacilli dried for three months or longer may retain its biological activities, becoming reactivated in the presence of its necessary pabulum.

The impression on man's mind of the contagion was first set in the seventeenth century by Solleysel. In 1734 Gaspard Saumer gave strict regulation as to the disinfection of stables wherein glanders existed, such as the burning of cribs and racks, the removal of the plaster, etc. Seven years later Gersault first suggested the immediate slaughter of the diseased horses and the isolation of suspicious cases; and in this era we find that horses are permitted to live for days before slaughter, due to some sort of delay on account of State laws, in effecting the condemnation by the State, the appraisal, and then the slaughter. All this could be done in a single day. Often horses have died while waiting for the appraiser to appear on the scene and, gentlemen, these last remarks are in reference particularly to clinical cases where there is no question as to diagnosis.

In this respect a branch office could be established in a large cosmopolitan city of this kind, with a deputy commissioner with full powers or some other person in his stead to hasten or expedite the disposal of these cases.

We have in this State about 600,000 horses or more, about one million cows and a million of dogs. By proper legislation a yearly tax of one dollar for each horse, fifty cents for a cow, and one dollar for a dog could be fixed on the individual owners, and each year the State would have this additional income for a fund, which approximately would be $2,500,000, and the same turned over to a live stock sanitary department and systematically testing and registering each horse and cow, and licensing and enforcing the muzzling of dogs; to give certificates of health on the horse and cow, also taking into consideration the public health as to the food it eats, the milk it drinks, and doing away with rabies at the same time. Under this system the sale of the horse could not be consummated without a certificate of health. This live stock sanitary bureau could investigate, indemnify the owner for his loss, and institute proper means for the eradication of glanders, going from one end of the State to the other.

The cases of reported recovery of glandered horses, if any, are so few and the probability of a cure so questionable we must take into consideration a possible error in diagnosis.

With preventative inoculation as a cure by means of vaccine, it is my opinion that it cannot be properly done by mitigated cultures artificially grown of the specific bacilli, and in order to get a specific vaccine, experiments should be carried out in some other animal less susceptible, in which it does not prove fatal, where we might get a given virulence, and still producing a protective form; this probable method on the same lines and theory of Jenner in Variola.

Improper stable management I believe, to be one of the most prolific causes of this contagion. A continuous supply of fresh air is always necessary for the maintenance of life. The stable of the gentleman is lofty and roomy, the horse is not crowded and here the disease is not so often found as in the case of the horse dealer where almost daily a different horse is put into the same stall. The danger from exposure to infection can scarcely be avoided by those horses that travel a great deal and put up over night in a transient stable, where often nightly a different horse has been stalled.

It is remarkable how some horse owners seem to dread the law when they are informed by their veterinarian that one of their horses is suffering with glanders, and the same must be reported to the proper health authorities. Also we hear and receive the abandoned glandered horses on the highways where they are left during the night by the owner or his agent, who has no regard for the law.

Ventilation and cleanliness of stables must stand side by side, proper sewerage and drainage and the daily removal of the manure.

I have submitted several questions to myself. What is to be done with the so-called sleeper or carrier that looks too good to be slaughtered? Is he not detrimental to the other horse in the same stable? Some of these under present conditions are permitted to live and work under a provisional quarantine. Is this quarantine enforced, in which instructions have been given to water separate and keep him isolated from the other horses? This quarantine from my observation is good in theory, but in

reality not faithfully performed. An instance—a huxter, or one-horse expressman or liveryman, who permits anyone to drive the animal on the public streets; let us follow him, and in the course of the day's work what happens; when on the road, the animal is dry and must be watered. The first saloon in front of which there is a watering trough the driver stops, as such troughs are placed there as an inducement for the driver to stop to water the animal, and at the same time for the driver to replenish his thirst with some liquid stronger than water. In this instance there is no proper quarantine.

But what do we know of glanders that exists in our stables in hundreds of instances that kills the poor working horse as well as the millionaire's trotter, that though it progresses slowly nevertheless kills, these are facts, and what are we to do to overcome them.

In conclusion I would make a plea for co-operation between the veterinarians of the Department of Agriculture, those of the Health Department with the attending veterinarian, so as to avoid false impressions in the minds of the owner.

That the destruction of glandered horses should not be permitted on the public highway by means of the bullet, but be destroyed by some other means in a bloodless manner. The reason is obvious for such reform.

Your slaughtering of one infected animal here and there is not going to stop the spread of this contagion. Early recognition, the co-operation of State and city authorities, and the disposal of these infecting animals, who to date have not responded to modern scientific treatment, appeals to me to be the rational of judgment.

Missouri Valley Veterinary Association will hold its big winter meeting in Kansas City towards the end of January, and will be well attended. Tentatively the dates are January 22, 23, 24, 1913. A final announcement will be made in our next number, and the dates above either confirmed or corrected.

MY EXPERIENCE WITH ANTI-HOG CHOLERA SERUM.*

By F. M. Starr, D.V.M., Odessa, Mo.

Hog cholera appeared as an epidemic throughout Missouri during the season of 1911, which was a very dry one, and the disease is supposed to be brought on from the drying up of stagnant pools of water. The disease is still with us in an endemic form, but has lost its virulence to a great extent since its first appearance.

The loss in dollars cannot be estimated, as the death loss is not the greatest, for as soon as hogs became sick they were immediately pushed off to market, pigs from thirty pounds up to all the brood sows were sold at a sacrifice. Hogs for home consumption were almost unattainable, and many a poor renter went without his winter's meat. All hogs marketed were poor and not fit for market, which meant a great loss. Some think the faulty corn was the cause of the disease, but the disease appeared many months before the crop was matured. There is some dispute as to the nature of the disease. My experience has led me to think it genuine hog cholera, but symptoms in various herds differ, and in referring to our best authors it is hard to make a differentiation.

My experience with anti-hog cholera serum for its treatment has been excellent in most cases, which helps to make a diagnosis, as we would not get the results if it was not hog cholera. When a serum is made from the sick hogs of our own country it is the only way we can expect to get a serum that is adapted to offset the infection which our hogs are carrying, and if we get results the serum should have the credit. Without its use the loss was from 80 to 90 per cent.

One bunch of hogs I especially remember for its virulency was a bunch of fifty shoats which averaged about seventy-five

* Presented to the Missouri Veterinary Medical Association at Marshall, July, 1912.

pounds, which I was called to see. They were so badly infected I decided to let them alone and in three weeks every one of the fifty shoats had died, which was a fatality of 100 per cent. This same client had one hundred and seven head on an adjoining farm which was also infected. We gave them the simultaneous method and lost twenty-five head out of the hundred and seven, also some hogs had died before the treatment and some of the worst infected ones we did not vaccinate, so we had a loss of less than 25 per cent., which looks better than 100 per cent.

Owing to the expense of the serum it is hard to get the best results, as no client that I have had will stand for the double dosage of the serum. The proper way to get results in an infected herd (and in only one herd have I had this pleasure, and without any loss) is to give the serum treatment and in twenty days give the simultaneous treatment. This is for an infected herd. It looks imprudent to use the simultaneous treatment on an infected herd, but I would rather have my loss at the beginning and all at once, than to have them reinfected in four or five weeks and begin to die, which gives you a dissatisfied client who gives serum a black eye, of which I have had such experience.

I do not think sanitary police measures will give results as stock hogs are allowed to roam over a farm, so a sanitary plot of ground would be hard to obtain and if so the hogs could be infected by its being carried by attendants, dogs, birds, crows and pigeons. The use of serum is just in its infancy and a great deal is to be learned about its use, some is more potent than others, so dose may be too small. The physicians are getting better results from the use of diphtheritic serum, as they use it immediately upon diagnosis and in larger doses than when they first commenced its use. The longer we wait to use a serum the less chance we have to counteract the fast forming toxins. Hogs with a temperature not higher than 104° Fahrenheit I have had good success with the simultaneous treatment by cutting my doses of virulent blood to half the amount, and I find if hogs eat shelled corn they are fit subjects to vaccinate. I have no success

in treating sick hogs with serum, but find it prolongs their life three or four weeks. But I have had some success with sulphocarbolate compound tablets used in all drinking water and slop. Farmers will vaccinate only when they have the disease in their own herd, or their neighbors, which does not give the simultaneous method a fair test. When hogs are once vaccinated the spring pigs should be also vaccinated at the time when the last that were farrowed have reached about the weight of fifteen pounds. This method will always be cheaper as the dose will always be smaller, and if all farmers would keep up this method for a few years the disease might be eradicated.

When you vaccinate a client's hogs, vaccinate all or none at all, as the unvaccinated hogs may contract the disease if not isolated. Where sows are with pigs, do not use the simultaneous method as they will abort, and if sow is suckling pigs, just use serum. If pigs are vaccinated and sow also with the simultaneous method. I know the milk contains some virus which with the virus from vaccination is too much for the pigs and causes their death and sow dries up in her milk. I know this is not from the want of milk, as I have had pigs that were eating well and large enough to wean, die. The sow should receive the serum alone, which does not affect the milk. Hogs after vaccination should be fed very little and, better still, let them have nothing but grass during fever stage. I have noticed some reactions from vaccination that shows that serum is not of the same potency, some vaccinated bunches will show no reaction whatever from its use, while others will look as though they were having the genuine disease, eyes full of a sticky discharge, cough, weakness of posterior extremities; they lie back in their beds, eat very little, but in fifteen or twenty days come out in good condition. The reaction is so intense it is not pleasant for the practitioner as the client has to be kept pacified.

On November the thirteenth I vaccinated ninety head of shoats in which I had very discouraging results as you will see by my chart, hogs appeared healthy, and to be certain I took several temperatures, which were normal. In ten days the hogs took a

Simultaneous.

Date.	Name.	No.	Infected.	Loss.
Nov. 9, 1911.	Geo. Havener	40	No (sold)	0
Nov. 9, 1911.	O'Filler	60	Yes	30
Nov. 10, 1911.	Jno. Keith	72	No	28
Nov. 11, 1911.	Will Johnson	9	Yes	2
Nov. 13, 1911.	I. Bedsand	90	No	36
Nov. 14, 1911.	W. Johnson	73	Yes	25
Nov. 14, 1911.	P. Brannock	43	Yes	20
Nov. 15, 1911.	L. X. Anderson	24	Yes	5
Nov. 15, 1911.	H. B. Smith	21	Yes	3
Nov. 15, 1911.	Geo. W. Smith	46	Yes	4
Nov. 17, 1911.	Lewis Johnson	105	No	5
Nov. 18, 1911.	L. Anderson	21	No	0
Nov. 27, 1911.	J. C. Cobb	16	No	1
Feb. 24, 1912.	A. O. White	62	Yes	18
Apr. 11, 1912.	J. Dennis	13	Yes	0
May 14, 1912.	Tanner Bros.	42	No	0
June 21, 1912.	J. Sanders	116	No	0
July 6, 1912.	A. T. Robinson	48	No	0
July 10, 1912.	Shons & Wakeman	34	Yes	0
	Totals	1,750		256

Percentage of loss ..... 17 2-5.

Simple Treatment.

Date.	Name.	No.	Infected.	Loss.
July 10, 1910.	O. T. Hook	60	Yes	20
July 12, 1910.	W. Lunn	15	Yes	6
Sept. 18, 1911.	R. F. Slusher	42	Yes	10
Sept. 19, 1911.	Al Barnett	13	Yes	7
Sept. 21, 1911.	Eagan & Gam	20	No	0
Sept. 26, 1911.	W. Lewis	27	No	0
Oct. 10, 1911.	T. Lale	12	No	0
Oct. 12, 1911.	Lowery Doty	34	No	12
Dec. 12, 1911.	H. Leise	56	Yes	35
Jan. 5, 1912.	T. J. Slack	17	Yes	1
Jan. 31, 1912.	P. Anderson	12	No	0
Jan. 31, 1912.	W. Drake	34	Yes	20
Jan. 24, 1912.	A. Beal	80	Yes	10
Jan. 25, 1912.	P. Anderson	6	No	0
Apr. 11, 1912.	Jem Dennis	13	Yes	0
	Totals	441		125

Percentage of loss ..... 28.

SIMULTANEOUS.

Date.	Name.	No.	Infected.	Loss.
Oct. 2, 1911.	Pearcy & Sox	131	No	3
Oct. 9, 1911.	D. Vamer	20	No (sold)	0
Oct. 16, 1911.	A. T. Robinson	60	Yes	3
Oct. 27, 1911.	K. Tracey	150	Yes	5
Nov. 1, 1911.	A. Laughlin	82	Yes	30
Nov. 1, 1911.	J. Vanneter	26	No	0
Nov. 3, 1911.	Tanner Bros.	68	Yes	0
Nov. 4, 1911.	L. Doty	83	No	0
Nov. 6, 1911.	Marterson Bros.	66	No	0
Nov. 7, 1911.	J. Vanneter	12	No	0
Nov. 7, 1911.	J. Dasher	34	Yes	8
Nov. 7, 1911.	J. C. Cobb	17	No	0
Nov. 9, 1911.	H. Huppman	66	Yes	30

peculiar disease which I think was septicemia. They became blind, bled at nostrils, foamed at the mouth, became paralyzed, had convulsions and skin was bluish purple over entire body. The hogs lived but a few hours, thirty-six died out of the ninety. I believe that serum must have been infected.

In vaccinating I think we should disinfect parts where needle is introduced, wash parts clean with cotton, when dirty throw away and take a clean piece. Do not puncture more than once if possible, and if hog moves so that needle has to be withdrawn, change to a new field, do not puncture in the same location. I have had very little trouble from infection at point of injection. I always pinch the skin when I withdrew my needle so there is no escape of serum or virulent blood, then wipe off with antiseptic. If client has a dipping tank I like to run the hogs through the tank as fast as they are vaccinated, if the weather is warm.

November 14th I was called to vaccinate seventy-five head, found them all sick. We picked out twenty-four of the best looking ones, their temperature ranged up to 104 degrees Fahrenheit. We vaccinated them with simultaneous treatment and lost five out of the twenty-four. We used Hog Cholera Specific on the remaining fifty-one and lost every one. We were very sorry we did not use the double method on all, and more than likely have saved 25 per cent. of them.

December 12th I administered serum to fifty-six head, of which twenty head were sick. One old sow, which appeared healthy at time of treatment, died in two days, there was no swelling at point of injection and all of the well hogs showed a decided reaction from the serum. I lost thirty-four out of the fifty-six.

October 12th I gave the simple treatment to thirty-four head which were not infected. In ten days after the vaccination the owner placed two in a neighbor's pen of sick hogs and in about fifteen days they contracted the disease and died of cholera. He does not have much faith in the single treatment, but thinks the simultaneous treatment is a success if there is no cholera among hogs. I have since vaccinated seventy-five head for him with no loss.

I feel I have good success with the use of the simultaneous treatment when it was used during the greatest epidemic our part of the country has ever had. If serum is properly used, and the virulent blood very cautiously used and properly destroyed when left over, and especially kept out of the hands of the laity, such an epidemic as we have just experienced should never occur with such great loss. In my part of the country every liveryman, auctioneer and castrator were all over the country using the simultaneous treatment, which is ridiculous to think of.

Thus I have given you a few of my experiences in the use by the serum and simultaneous method of 2,191 head with a loss of 381 head, when cholera was raging in the form of an epidemic.

High Honor for a Distinguished Veterinarian.—The following, clipped from one of the British dailies by the senior editor, will be of interest to the many readers of the Review who had the pleasure of meeting Professor Hobday on the occasion of his visit to America in 1911: "Veterinary Surgeon to the King—Master of the Horse's Office, Royal Mews, Buckingham Palace, October 30. The King has been graciously pleased to appoint Mr. Frederick Hobday, F.R.C.V.S., to be an Honorary Veterinary Surgeon to his Majesty."

SERUM THERAPY BY THE SIMULTANEOUS METHOD FOR THE PREVENTION OF HOG CHOLERA.*

By E. A. Buxton, D.V.S., Vinton, Iowa.

Never in the history of Iowa was the farmers great industry of hog raising threatened with such complete destruction as at the present time. I think the monetary loss in the hog industry alone from cholera in this State far exceeds all other diseases of the lower animals combined. A fair estimate of the loss of hogs from cholera, their feed and care in the last year would approximate a loss of fifteen million dollars to the farmers of this State. This condition is not confined to Iowa alone, but nearly all of the corn-raising States of the Union are likewise affected. It is this great monetary loss to our clients, the farmers and swine raisers, that has prompted me to bring the subject of serum therapy before the veterinarians here assembled that we might by careful study and discussion be better enabled to demonstrate to the thinking swine raisers of our State, who have spent years in building up a fine herd of hogs, that it is unnecessary for them to lose the results of all of their work and care in a single week, but that by immunizing their hogs while well they can be able to save them and thus save great loss.

In bringing this subject briefly before you I can only give my experience in the last eight months with hog cholera serum. It must be conceded that the most scientific method used for the permanent prevention of hog cholera is the serum simultaneous method. It can not be claimed that this method is always sure. It has some drawbacks. One of these is the apparent susceptibility of some herds to inoculation. This danger wherever found is among weak, poorly cared for and unthrifty hogs. The main consideration in these experiments is one of virulence. It is a well-known fact that we have found virus of a high virulence

* Presented to the twenty-fifth annual meeting of the Iowa Veterinary Medical Association at Ames, November 12, 1912.

that will give positive results. On the other hand, virus of a low virulence will give sometimes slight results and even no results at all. The most exhaustive and careful experiments conducted with close observation has served only to show that by using good potent serum and a virus from hogs in acute stages of cholera with the temperature of 107 degrees or higher that there was no question of positive results, while the per cent. of loss in healthy herds may be a little greater, the results will be far more satisfactory, as the hogs will be rendered immune during their natural lives. I think the use of weak virus accounts for so many failures to produce permanent immunity and is the chief cause of many outbreaks of cholera in two or three months after treatment. After giving the serum therapy many years of careful study, I decided the simultaneous method for the prevention of hog cholera was the most feasable and beneficial method. In order to get the swine raisers interested in that method, I made public demonstrations to test the efficiency of hog cholera serum. I invited the public to witness these demonstrations. I immunized healthy hogs by the simultaneous method, placing them in infected pens where sick hogs had been kept and died and post-mortems held, I then injected virulent cholera blood into healthy hogs to make them sick, put them together with sick cholera hogs in the pens with the immunized hogs, subjected them to the most severe tests possible. As fast as a hog which had not been treated died, I permitted the immunized hogs to eat up the deceased ones and never experienced a loss by death of a single immunized hog. I have found in my experience during the last eight months, covering the treatment of seventeen thousand hogs, that during the extreme hot weather the per cent. of loss of hogs that had been exposed three days before being immunized was much greater than in cooler weather.

I have several herds of hogs that were immunized early in the spring and that I have been in repeatedly during the season vaccinating the pigs that were farrowed at different intervals, where little pigs that were treated early were less than three days old. I have several hogs that after being vaccinated for

months have been put in infected herds throughout the country that had cholera in the worst form. I have herds where dead cholera hogs were fed to immunized hogs that were vaccinated months before and in none of the above cases have I had a loss of a single hog from cholera in any of the experiments made.

What I desire to show by the foregoing illustrations is that the immune is permanent. That if it was not permanent the above illustrations would show deaths from cholera.

It is by these numerous demonstrations held in different parts of my own country that I have satisfied myself and convinced all interested persons in the swine industry that their hogs were permanently immune. In my experience in immunizing hogs for over two hundred different farmers in Benton County I am pleased to here state that there has not been one outbreak of cholera in any of the herds where the simultaneous method was used and the hogs recovered from the treatment, although many have been exposed in different places during the past eight months.

It is my profound conviction that by using a potent serum manufactured from virulent virus, produced from hogs with cholera in the acute stages of the disease, together with a good strong virus in the simultaneous treatment, we will have all the therapeutic action in producing immunity that the founders of the serum claim for it.

Not only investigating men of our profession but the owners of hogs are beginning to realize that the time to treat hogs is while they are healthy. If so treated the percentage of loss in a healthy herd rarely exceeds 3 per cent.

I need not call your atention to the large percentage of destruction in hogs when cholera gets a grip on them.

FLASHED UPON THE CANVAS DURING PROF. CHITTICK'S TALK AT THE AMES BANQUET.—"Sunshine is nature's disinfectant. Sanitary instruction is more important than sanitary legislation."

REPORTS OF CASES.

FOURTEEN CASES TREATED WITH PHYLACOGENS.

By F. N. Sawyer, M.D.C., Bakersfield, Cal.

Case 1—Subject, chestnut colt, five months old; first seen October 2, 1909. Temp. 104.8, pulse 60, resp. 26; was running at the nose, had some laryngitis and slight swelling of the glands of the neck. Colt was very quiet and off feed for three days. Diagnosis, distemper.

October 2, 1909, gave 10 c.c. mixed infection distemper phylacogen subcutaneously.

October 3, 1909, large swelling at site of injection, less running of the nose, glands less swollen. Nine a. m., temp. 101.6, pulse 45, resp. 18. Colt seems brighter, has taken some feed. Gave 10 c.c. mixed infection distemper phylacogen subcutaneously.

October 4, 1909, 9 a. m., temp. 100.2, pulse 40, resp. 18. Colt is bright and lively, no running at the nose, glandular swelling all gone, visible membranes normal, colt feeding naturally.

October 5, 1909, 8 a. m., temp., pulse and resp. normal. Twelve noon colt discharged.

Case 2—Subject, a brown colt, seven months old; first seen February 10, 1910. Temp. 105, pulse 55, resp. 24; running of the nose and eyes, laryngitis with some cough, glands of the neck much swollen, visible membranes very red; quiet and listless and off feed for the past four days. Diagnosis, distemper.

February 10, 1910, gave 10 c.c. mixed infection distemper phylacogen subcutaneously.

February 11, 1910, 10 a. m., temp. 102.5, pulse 50, resp. 22. Colt is brighter, visible membranes less red, less running of the nose, glandular swelling much less. Gave 15 c.c. mixed infection distemper phylacogen subcutaneously.

February 12, 1910, 10 a. m., temp. 100.2, pulse 40, resp. 18. Colt is lively and brighter, appetite good, visible membranes normal, glandular swelling all gone, no cough or running at the nose.

February 13, 1910, 10 a. m., temp., pulse and resp. normal. Colt discharged. Swellings moderate at the site of injections.

Case 3—Subject, chestnut colt, one year old; first seen April 9, 1910. Temp. 104.8, pulse 58, resp. 26; much running at the nose and eyes, laryngitis with cough, glands at the neck much swollen and indurated, visible membranes very red, quiet, listless and off feed for four days. Diagnosis, severe distemper.

April 9, 1910, gave 10 c.c. mixed infection distemper phylacogen subcutaneously.

April 10, 1910, 8 a. m., temp. 104.2, pulse 55, resp. 22, animal seems a little better. However, there is no improvement in the glandular swelling or color of the visible membranes and the animal is not eating. Gave 10 c.c. mixed infection distemper phylacogen subcutaneously.

April 11, 1910, 8 a. m., temp. 103.2, pulse 46, resp. 20. Two of the glands are soft and fluctuating, visible membranes less red, there is less cough and laryngitis. Incised the two soft glands and evacuated pus. Gave 20 c.c. mixed infection distemper phylacogen subcutaneously.

April 12, 1910, 8 a. m., temp. 101.2, pulse 40, resp. 18; colt is much brighter, appetite better, visible membranes very slightly red, the other glandular swellings nearly gone. Gave 30 c.c. mixed infection distemper phylacogen subcutaneously.

April 13, 1910, 9 a. m., temp. 100, pulse 38, resp. 18; colt lively and bright, appetite good, glandular swelling all gone, visible membranes normal, no dose.

April 14, 1910, 9 a. m., temp. 100, pulse 38, resp. 18, owner took the animal home.

Case 4—Subject, roan horse, four years old; ordinary draft. First seen April 20, 1911, temp. 104.6, pulse 60, resp. 30; visible membranes very red, eyes watery, laryngitis with cough; is constipated, has been quiet and off feed for three days. Diagnosis, influenza.

April 20, 1911, gave 15 c.c. pneumonia phylacogen intravenously, followed by moderate reaction in 10 minutes, during which the pulse was 70, resp. 36.

April 21, 1911, 7 a. m., temp. 102.4, pulse 50, resp. 24. Horse seems slightly improved, appetite poor, has no cough, visible membranes less red. Gave 15 c.c. pneumonia phylacogen intravenously. Seven p. m., temp. 101.4, pulse 50, resp. 22, is much brighter, running of the eyes nearly gone, visible membranes less red, is eating a little. Reaction from dose slight, pulse 60, resp. 32.

April 22, 1911, 7 a. m., temp. 101, pulse 45, resp. 20. Horse is much better, appetite good, visible membranes nearly normal,

no running of the nose or eyes. Gave 30 c.c. pneumonia phylacogen intravenously with moderate reaction, pulse 56, resp. 26; 7 p. m., temp. 100, pulse 40, resp. 19.

April 23, 1911, 9 a. m., temp. 100.2, pulse 38, resp. 18; 12 noon owner took the animal home.

Case 5—Subject, bay mare, six years old; light draft. First seen June 12, 1911, 10 a. m., temp. 104.6, pulse 62, resp. 30. Visible membranes much injected, slight running of the nose and eyes, laryngitis with some cough, tendency to purpuric swellings of the front legs, is constipated, has been off feed for four days. Diagnosis, influenza.

June 12, 1911, gave 15 c.c. pneumonia phylacogen intravenously, followed in 20 minutes by strong reaction, pulse 74, resp. 40, animal trembled, urinated and laid down; 7 p. m., temp. 103.6, pulse 55, resp. 26.

June 13, 1911, 8 a. m., temp. 102.6, pulse 50, resp. 22; seems slightly better, there is less running from the nose and is eating a little. Gave 15 c.c. pneumonia phylacogen intravenously, followed in 30 minutes by mild reaction.

June 14, 1911, 8 a. m., temp. 101.8, pulse 48, resp. 22. Is brighter, no running from the nose and eyes, appetite better, visible membranes less red. Gave 30 c.c. pneumonia phylacogen intravenously, followed in 20 minutes with strong reaction, pulse 64, resp. 30, animal trembled and laid down.

June 15, 1911, 8 a. m., temp. 100.2, pulse 40, resp. 18, is bright and lively, appetite good, visible membranes normal.

June 16, temp., pulse and resp. normal, 12 noon owner took the animal home.

Case 6—Subject, a gray horse, eight years old; ordinary draft. First seen June 20, 1911, temp. 104.2, pulse 58, resp. 28, visible membranes very red, animal is weak, running from nose, constipated, urine very red; has laryngitis with cough. Diagnosis, influenza, severe; prognosis, doubtful.

June 20, 1911, gave 10 c.c. pneumonia phylacogen intravenously, reaction moderate; 6 p. m., temp. 103.2, pulse 50, resp. 26. Animal seems less distressed, has had several large bowel movements. Gave 10 c.c. pneumonia phylacogen intravenously, reaction very slight.

June 21, 1911, 9 a. m., temp. 102.2, pulse 46, resp. 22. Horse is brighter, less running from the nose, less cough, urine clearer, animal is eating a little. Gave 15 c.c. pneumonia phylacogen intravenously, reaction moderate; 8 p. m., temp. 104, pulse 40,

resp. 20. Gave 15 c.c. pneumonia phylacogen intravenously, very slight reaction. Prognosis, favorable.

June 22, 1911, 7 a. m., temp. 101.2, pulse 38, resp. 20. Animal seems bright, running from the nose about gone, no laryngitis, no cough, appetite better, visible membranes nearly normal, urine is much clearer. Gave 30 c.c. pneumonia phylacogen intravenously, very strong reaction; 8 p. m., temp. 100.6, pulse 40, resp. 20, appetite better, bowel movement free, urine clearer.

June 23, 1911, 8 a. m., temp. 100.2, pulse 40, resp. 18. Animal is bright, appetite good, head and throat symptoms gone. Gave 30 c.c. pneumonia phylacogen intravenously, reaction moderate.

June 24, 1911, temp., pulse and resp. normal, 12 noon owner took the animal home.

Case 7—Subject, a blue roan mare, six years old, driving horse. First seen July 19, 1911, 10 a. m., temp. 102.8, pulse 54, resp. 22. Both front feet very painful and sore, horse hardly able to walk, constipated, off feed. Diagnosis, laminitis, first attack.

July 19, 1911, 11 a. m., 20 c.c. mixed infection phylacogen intravenously, reaction moderate.

July 20, 1911, 9 a. m., temp. 100.4, pulse 45, resp. 18. Less pain, is able to move around in stall with but slight evidence of pain. Has had three or four large bowel movements, is eating; 20 c.c. mixed infection phylacogen intravenously, reaction moderate.

July 21, 1911, 9 a. m., temp. 100, pulse 40, resp. 16. Animal moves around stall without pain, is bright, appetite good. No dose, orders rest for three days more.

July 24, 1911, owner drove horse.

October 5, 1912, horse had been working steadily, has had no further recurrence.

Case 8—Subject, brown stallion, eight years old, driving horse. First seen August 20, 1911, temp. 103, pulse 56, resp. 20. Both front feet very painful and tender, can hardly move for pain. Is constipated and off feed. Diagnosis, laminitis, first attack.

August 20, 1911, 12 noon, 20 c.c. mixed infection phylacogen intravenously, reaction moderate.

August 21, 1911, 8 a. m., temp. 100.2, pulse 44, resp. 18. Feet very much less painful, can move around in stall with slight evidence of pain. Is brighter and is eating some. Gave 20 c.c. mixed infection phylacogen intravenously, reaction mild.

August 22, 1911, 8 a. m., temp. 99.4, pulse 40, resp. 16. Moves around stall without pain. Rest for three days additional ordered, no dose. Animal is bright and is eating.

August 25, 1911, owner is driving horse.

November 1, 1912, has had no recurrence; has worked steadily since.

Case 9—Subject, black horse, four years old, draft type. First seen September 5, 1911, about 4 p. m., temp. 104.6, pulse 58, resp. 24. History, September 2, 1911, while turned out received a 6-inch barbed-wire cut just back of the right shoulder; September 4, 1911, pus began to accumulate and the adjacent soft parts were much swollen. Just back of the right shoulder is a deep cut from which considerable pus is draining, the soft parts are swollen and the swelling extends to the shoulder. The animal is having considerable pain and puts but little weight on the leg. Visible membranes red, appetite poor, animal is trembly and sweating. Diagnosis, severe infection of wire cut; prognosis, doubtful.

September 5, 1911, 4 p. m., incised lower corner of wound to insure good drainage, ordered 1 per cent. Kreso solution for antiseptic wash, gave 15 c.c. mixed infection phylacogen intravenously, reaction moderate.

September 6, 1911, 9 a. m., temp. 102.2, pulse 50, resp. 20. Has less pain, there is less swelling and discharge from the wound which is tinged with blood, is eating a little; gave 20 c.c. mixed infection phylacogen intravenously, reaction mild, Kreso solution continued. Prognosis, favorable.

September 7, 1911, 10 a. m., temp. 100.4, pulse 48, resp. 18. Free from pain, very little swelling of the soft parts, discharge much less, is thin, and serous, necrotic tissue sloughing off. Gave 30 c.c. mixed infection phylacogen intravenously, reaction moderate.

September 8, 1911, 9 a. m., temp. 100, pulse 44, resp. 16. No pain, no swelling, very little clear discharge from the wound which looks very healthy, ordered wound kept clean, needs no further treatment.

September 12, 1911, animal working.

Case 10—Bay mare, 10 years old, light draft. First seen September 20, 1911, temp. 103.8, pulse 60, resp. 26. History September 16, 1911, was kicked on the left flank. There was large swelling and bruising of the skin with considerable soreness. September 19, 1911, the swelling seemed very soft and the animal was sweaty and off feed. There is a large soft mass

10 inches across on the left flank; there is fluctuation, no appetite. Diagnosis, large abscess; prognosis, favorable.

September 20, 1911, made a 6-inch incision in the lower part of mass, evacuated a large quantity of pus. Washed out with 1 per cent. Kreso solution. Gave 20 c.c. mixed infection phylacogen intravenously, reaction moderate.

September 21, 1911, 9 a. m., temp. 100.8, pulse 45, resp. 20. Drainage from abscess, thin pus with blood and small in the amount, no pain, is eating. Gave 30 c.c. mixed infection phylacogen intravenously, reaction moderate. Kreso wash continued.

September 22, 1911, 10 a. m., temp. 99.6, pulse, 42, resp. 18. Discharge very scanty and serous. There is much sloughing of necrotic tissue, no pain, appetite good.

September 23, 1911, 9 a. m., thin clear discharge, wound looks healthy, ordered wound kept clean, needs no further attention.

September 25, 1911, animal working.

Case 11—Chestnut horse, six years old, driving. First seen October 8, 1911, temp. 104.2, pulse 58, resp. 26. History, October 4 or 5 while running in lot was snagged with a sharp stick on the right shoulder. It was swollen and sore, but didn't get bad until October 8. Found a puncture wound on the right shoulder about 3 inches deep. There is much green pus draining away, and the surrounding soft parts are much swollen, the animal is in pain, uneasy and perspiring, no appetite. Diagnosis, infected punctured wound, with septicaemia; prognosis, doubtful.

October 8, 1911, no incision necessary, washed out with 1 per cent. Kreso solution. Gave 20 c.c. mixed infection phylacogen intravenously, reaction moderate.

October 9, 1911, 9 a. m., temp. 101.8, pulse 48, resp. 20. Has only slight pain, discharge lighter in color with streaks of blood. Surrounding swelling much less, is eating a little. Gave 30 c.c. mixed infection phylacogen intravenously, reaction strong. Ordered Kreso wash continued.

October 10, 1911, 11 a. m., temp. 100.8, pulse 46, resp. 20. No pain, discharge more serous and much less in amount, very little swelling, appetite fair. Prognosis, favorable. Gave 30 c.c. mixed infection phylacogen intravenously, with moderate reaction.

October 11, 1911, 9 a. m., temp. 99.8, pulse 38, resp. 17. No pain, no swelling, discharge very scant, appetite good, Kreso continued.

October 12, 1911, temp., pulse and resp. normal. No dose, wound ordered kept clean.

October 16, animal at work.

Case 12—Gray horse, ten years old, large draft. First seen September 6, 1911, temp., pulse and resp. normal. History, since September, 1910, has been in poor condition, has been able to work most of the time but is thin, at times seems weak and always sweats easily, has lost weight in spite of good care, careful feeding and occasional short courses of tonic.

September 6, 1911, owner brought animal in for examination, I could find nothing wrong. Appetite fair, has occasional constipation or diarrhœa, but most of the time bowels are normal. Gave 15 c.c. mixed infection phylacogen, followed by moderate reaction in which the pulse was 56, resp. 24. Later in the day owner took animal home. I advised the owner to work the animal lightly for two or three days and to bring him back in seven to ten days if there was no improvement. At the end of two weeks the owner brought in two other animals in the same condition and said: "Inject these two, the other horse is doing fine."

Case 13—Black horse, seven years old, light draft. First seen October 10, 1911, temp. 103.4, pulse 55, resp. 24. Visible membranes red, is very weak, sweats easily, muscles of the back corded, urine scanty and quite red, bowels constipated. Diagnosis, azoturia; prognosis, fairly good.

October 10, 1911, gave 15 c.c. mixed infection phylacogen subcutaneously plus ½ grain arecoline.

October 11, 1911, 9 a. m., temp. 102.8, pulse 54, resp. 24. Horse is slightly better but continues weak and sweaty, appetite poor, is passing more urine. Gave 15 c.c. mixed infection phylacogen subcutaneously.

October 12, 7 a. m., temp. 102, pulse 50, resp. 20. Is a little more improved, back muscles less corded. There is less weakness of the loin and hip muscles, urine lighter colored and is passing more; is still sweaty. Gave 30 c.c. mixed infection phylacogen subcutaneously.

October 13, 1911, 8 a. m., temp. 100.6, pulse 44, resp. 20. Animal is much brighter, appetite is improved, is stronger. Cording of back muscles gone, urine and bowels normal. Gave 30 c.c. mixed infection phylacogen subcutaneously.

October 14, 1911, 9 a. m., temp. 100.2, pulse 40, resp. 16. Animal is bright and strong, appetite good.

October 16, 1911, animal discharged.

Case 14—A sorrel driving mare, seven years old. First seen January 15, 1912, temp. 102.6, pulse 50, resp. 20. Animal can hardly walk on account of pain in both front feet, both front

legs are very stiff and sore. Animal has a ring bone on the right hind foot (has had both these conditions for two years to my knowledge). Appetite poor, constipated. Diagnosis, navicular disease.

January 15, 1912, gave 15 c.c. pneumonia phylacogen subcutaneously.

January 16, 1912, 9 a. m., temp. 101, pulse 48, resp. 20. Animal seems about the same, is perhaps a little less stiff. Gave 15 c.c. pneumonia phylacogen subcutaneously.

January 17, 1912, 8 a. m., temp. 100.6, pulse 44, resp. 18. Is brighter, appetite improved, seems less sore, moves around a little in the stall. Gave 30 c.c. pneumonia phylacogen subcutaneously.

January 18, 1912, 9 a. m., temp. 100, pulse 40, resp. 16. Appetite good, can move about less stiffly, has surely less pain. Gave 30 c.c. pneumonia phylacogen subcutaneously.

January 19, 1912, 9 a. m., temp. 99.8, pulse 42, resp. 17. Animal is much improved, is less stiff, moves around in stall freely, both front feet still tender. Gave 30 c.c. pneumonia phylacogen subcutaneously.

January 20, 1912, temp. 99.8, pulse 40, resp. 16. Is bright, appetite good, can walk without pain, right front foot only slightly tender. Gave 30 c.c. pneumonia phylacogen subcutaneously.

January 21, 1912, temp. 100, pulse 38, resp. 16. Is still more improved. No tenderness in either front foot. Can walk without stiffness or lameness. Gave 30 c.c. pneumonia phylacogen subcutaneously.

January 22, 1912, temp., pulse and resp. normal. Gave 30 c.c. pneumonia phylacogen subcutaneously. Ordered three days additional rest, after which light work for a week. Animal discharged.

Silver Wedding—Dr. and Mrs. George H. Glover celebrated the twenty-fifth anniversary of their wedding day on November 19, last, and we are sure that the entire veterinary profession throughout the land wish them joy and hope that they will celebrate their golden wedding together. The humerous doctor said in a recent letter, referring to the approaching anniversary, "fifty years or bust," and we sincerely hope he reaches his goal.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Some Clinical Cases: [*W. R. Davis, M.R.C.V.S.*]—*Rhododendron Poisoning.*—Thirteen young cattle and thirty sheep broke through a fence and got into a field where there was a number of rhododendrons. The animals ate a considerable quantity of them, and some exhibited symptoms of poisoning. They staggered about, falling and rising; their eyes were staring and glossy. They slabbered, foamy saliva hanging about the mouth. Some vomited greenish material. Others had gnashing of the teeth, straining and diarrhoea. Only one animal died. The others were treated with oil, linseed gruel and bicarbonate of soda. They recovered.

Uterine Eversion in a Mare.—A short time after foaling and having received proper attention, a thoroughbred mare is rolling about with the uterus extruded. The animal is sweating, greatly excited, in pain, throwing herself down, rolling over and straining. The mare standing up, a twitch was put on her lip, the near fore leg held up, while two other assistants supported the womb and raised it as high as they could. The organ being held up and well washed with antiseptic, it was gradually pushed back in position and a West's clamp put on. There was no bad symptom afterwards.

Difficult Parturition in a Mare.—A thoroughbred mare is unable to foal. Two forelegs and part of the head of the foetus are projecting beyond the vulva. The foreleg of another foal is felt on examination. Hobbles were immediately applied and chloroform administered. As the parts were dried, the uterus was injected with large quantity of mucilage of tragawurth. With some little difficulty both foals were successively pulled out, the chloroform having rendered all the manipulations much easier.—(*Vet. Record.*)

Open Stifle Joint [*Lieut. A. N. Foster, A.V.C.*].—Seven-year-old bay gelding received a kick and is lame on the off hind leg, with a punctured wound on the outside of the off stifle.

There is a cutaneous cut, one inch and a half long, and blood-stained synovia is escaping freely. The treatment was as follows: Hair clipped, region disinfected, wound carefully and thoroughly syringed with sublimate solution (1 to 100), closing of the wound with four pin sutures and dusting with boric acid powder; laxative and soft diet. There was much swelling and pain at first, but the temperature remained normal and the appetite good. There was discharge between the stitches for a few days; then it gradually subsided, and the horse was discharged after a few days with only a slight stiffness of the joint, which a blister and a run to pasture for a month would help to remove. —(*Vet. News.*)

Cardiac Disease in the Horse [*E. Wallis Hoare, F.R.C.V.S.*]—Record of a very interesting case which ended fatally and is related as the two acts of a drama.

First Act.—Horse convalescent from cold is about being purchased, but in no condition to be galloped. Nearly a month after he is brought back to be tested, but he was scarcely fit for a gallop, having yet accelerated respirations, a slight cough, a dropsical swelling of the sternum and on the sheath and a temperature of 101° F. Advice is given to take him home, but before he had gone but a short distance he staggers, nearly fell down, and on examination exhibited evidences of marked cardiac disorder. He was placed under treatment of a combination tonic, iodide and nux vomica, and gradually improved in the condition of the circulatory apparatus. After a while the owner (dealer) insisted to take him home. The horse was sold afterwards, hunted and reported perfectly sound.

Second Act.—Several months after, the writer was requested to attend the same horse (but did not recognize it at first). He presented the exactly same symptoms as before, and on the evidence given the advised destruction was carried out, ending the drama.

Post mortem: Heart enormously enlarged. Fluid in pericardial cavity. Heart was spherical in shape and weighed 24 pounds. The left side was excessively thick. The mitral thickened had its surface covered with calcareous projection; the edges were thick, also the chordoe tendinoe. The tricuspid had the same lesions. The stomach showed catarrhal gastritis.—(*Veter. Record.*)

Clinical Cases [*J. H. Parker, M.R.C.V.S.*].—A nasty stake which injured a Shire gelding in the right groin, close to the

penis, in the position that the testicle would have occupied if the horse had been entire. Casting the animal was necessary. It then was easily pulled out from a hole three feet six inches (?) deep, the length of the stake. It ran upwards and backwards as far as the middle of the left thigh. Considerable swelling took place and required several punctures with small trocar. Recovery was comparatively simple and short.

Cystic Calculi.—Four-year-old, wire-haired fox terrier bitch had passed six stones per urethra, varying in size from a pea to that of a bean. She was chloroformed. The bladder was full of stones, sixteen in all. The urethra was blocked with one. There were two as big as a golf ball. The mucus was thickened and bad color.—(*Veter. Record.*)

Fibrolysin [*Henry Taylor, F.R.C.V.S.*].—Aged horse had sprained his hock. The joint was swollen and very hard. Iodine liniment failed in reducing the enlargement. Stronger binodide of mercury was then applied, but not to the benefit of the horse, which, although not very lame, was unable to flex the hock even to a kick, such was the condition and amount of tissue.

Fibrolysin was then obtained. Five injections were made at 3, 4, 7 and 8 days apart, in the gluteal muscles, alternate sides being used, and in addition massage of the hock with weak iodine ointment. No bad result followed from the injections. The swelling of the hock diminished, the movements became freer, and finally both joints looked about the same.—(*Veter. Record.*)

Abscess of the Stomach Wall and Oesophagus [*Wm. Willis, M.R.C.V.S.*].—Aged mare has been dull in working and refused all food and drink. Temperature 102° F. She has had blowing fits during the day. The neck muscles are cramped. She takes handfuls of food, chews it some and drops it. Opening of the mouth with gag to examine the teeth set up movements as if she were about to vomit. Impaction of thoracic oesophagus is suspected. Arecoline is injected and followed by a second dose, as she then only drank quite freely after a period of salivation. For two or three days she seems to feel better. Then some swelling appeared at the base of the neck, round the entrance of the trachea into the chest, temperature ran up to 105° F., and finally the mare died on the eighth day of her sickness.

Post mortem: All abdominal organs healthy, except the stomach. The oesophagus was surrounded by a dark, dirty foul

effusion in the thoracic portion and on the cervical alongside the oesophagus and trachea there was connective tissue which seemed destroyed. The stomach showed a large abscess of its wall near the entrance of the oesophagus and seemed continuous with the lesions of this organ.—(*Veter. Jour.*)

NOTES ON A CASE OF TETANUS [*D. V. W.*].—Brown Arab filly, two years old, got a slight abrasion of the skin on the withers and from it got lockjaw. She is taken to dark loose box, and trephined on the cranial cavity, where 50 c.c. antitetanic serum are injected. Two ounces artificial Carlsbad salts in drinking water. A second injection is made the next day. During the night the mare falls and is unable to rise. The next morning she is much worse. Fifty c.c. antitetanic serum are injected by a new trephined spot on the cranium. Some improvement noticed in the afternoon. Tallianine is injected into the left jugular. Animal comfortable for the next two days. One pine of normal saline solution is injected in jugular. Two drachms of calomel in gruel. The day after, condition is worse, and collapse is feared. More Tallianine is injected with excellent results. Injections renewed for several days. Convalescence at last set in and recovery after five or six weeks. The case had been complicated with eversion of bladder on two occasions, but made ultimately complete recovery.—(*Veter. Jour.*)

INTERESTING FRACTURE OF OS CORONOE [*Prof. Hobday, F.R.C.V.S., and D. Dudgeon, M.R.C.V.S.*]—Well-bred Shire gelding got cast in the stall, off hind heel being caught in the loop of the head collar in such a way that the head was drawn back to the right side and the hind leg extended forward. There is only slight bruise of the heel. A few days after he becomes lame on that leg. He got over it after a few days and returned to work. Two days later is very lame again—abscess formed round the fetlock and front of the coronet. Treated, the animal does not improve, and an exploratory incision reveals the presence of a fracture communicating with the front of the pedal bone, with piece of loose bone. The horse was destroyed. The fracture was such that the interior of the os coronoe appears to be as if "scooped out," and the abscess apparently started from that, progressing downwards until the pedal joint became involved.—(*Ibid.*)

FRENCH REVIEW.

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

Cardiac Rupture in Anasarca [*Mr. C. Blain, Army Veterinarian*].—Five-year-old mare had given birth two weeks before to a healthy small mule. She has now lost her appetite, her milk, and has swellings of the four extremities. The animal is depressed, has temperature 39° C., the conjunctiva are covered with petechia. The vulva is swollen, red, painful and the seat of a muco-purulent discharge. Anasarca due to metritis is diagnosed. The uterus is injected with solution of permanganate, a purge, digitalis and acetate of ammonia are prescribed. As the swelling is increasing, ergotine is injected. Antistre stococcic serum not being at hand. After the second injection there is marked improvement. A third was made the following day. The animal dies almost suddenly. *Post mortem:* Opening of the thoracic cavity shows large mass of unclotted blood, with a rupture of the heart on the left side near the apex of the organ. Myocardium is soft. The rupture was attributed to the simultaneous use of digitalis and ergotine in an animal whose tissues were soft and in a state of degeneration—(*Journ. de Zootech.*)

Overloaded Intestines—Colic of Exceptional Duration—Recovery [*Mr. Payrou, Army Veterinarian*].—Horse has violent colic which is diagnosed as due to indigestion by overloading intestines. He is treated with alcoholized coffee, pilocarpine and arsenic in injection. The colic continues, notwithstanding a second dose of pilocarpine and a warm rectal injection. The next day, same condition; stercoral ball is detected by rectal examination, 300 grams of sulphate of soda are given and rectal injections. No result followed. More soda administered. Always negative results. This condition continues for several days. The appearance of the animal is bad, artificial serum is injected, castor oil administered. Yet no change. A fourth purgative is given and the animal left, his death being expected in the night. Instead of that, he is found the next morning up, eating his bedding and an enormous amount of droppings behind him, which was followed by another very large passage a few hours after. The constipation had lasted eight days.—(*Military Veter. Review.*)

Suppurative Osteomyelitis of the Lower Jaw—Trephining—Recovery [*Mr. Haan, Army Veterinarian*].—Four-

year-old filly receives a kick on the inferior border of the right branch of the inferior maxillary. It seems to be a slight injury, and an antiseptic dressing and treatment is prescribed for the wound, which soon leaves only a small fistula, healing readily by escharotic injections. After several weeks mastication becomes difficult. The masseterine region is swollen; there is a fistula in the intermaxillary space and another where the original wound was. The animal is cast on account of his irritable disposition, and the probing of the fistulas reveals a sensation of crepitation of the bony tissue. The fistulas communicate together. Suppurative osteomyelitis is diagnosed. The fistulas are freely opened, antiseptic injections and a coat of blistering ointment prescribed. No result is obtained. The animal is thrown, the soft tissues are freely incised to expose the bone, trephining of the maxillary branch, curetting and removal of two necrosed pieces are carried out. Alcoholic solution of gaiacol antiseptic washings and tincture of iodine formed the base of the after-treatment. However, a second trephining and curetting of the part was necessary before complete recovery followed.—(*Ibidem.*)

Generalized Melanosis in Horse [*Mr. Cabret, Army Veterinarian*].—Light grey gelding has had numerous melanotic tumors in various parts of the body and of different sizes. One at the tail necessitated the amputation of that organ. Recovery was perfect. Some eighteen months after the horse gets lame on the right hind leg, and it is found that the cause is located in the plantar cushion, it is a melanotic tumor. Removal is carried out after an attack of influenza that the horse contracted. The tumor removed weighed 40 grams and invaded the thickness of the internal branch of the plantar cushion. The case did not progress favorably. Abscesses formed under the cartilages of the foot; the infection spread upwards. Afterwards the left leg became disabled and the animal was destroyed. *Post mortem:* The anus, tail, sheath, flat of the thigh, urethral canal, inguinal lymph glands are filled with numerous melanotic deposits. At the entrance of the chest a tumor lies on the trachea; it is as big as an apple. Tumors are also found on the auriculo-ventricular openings of the heart. Melanotic tumor on the costal wall on the psoas muscle.—(*Revue Veterin.*)

Two New Cases of General Paralysis in Dogs [*Dr. L. Marchand and Prof. Petit*].—*First Case.* Fox slut, 15 months

old, is said by the owner to have become blind after an accident which occurred three months previous. At that time she had no wound or fracture of the cranium. Since the accident her disposition has changed; she is no more lively and knocks herself about all the time. Her eyes are motionless, and she does not take any notice of gestures made before her. Her walk is unsteady, wabbling, and her legs seem flexed. She looks as if she was deaf, acts so, manifests no pleasure when petted, appears to notice no one, and finally has become dirty in her habits. When examined by the doctor, the following symptoms were observed: No amyotrophy, no apparent signs of algesic sensibility, eyes are normal, pupils slow to dilate or contract. Negative ophthalmoscope examination. Iodurated treatment without result. Animal destroyed. At post mortem lesions of diffused meningo-encephalitis well marked.

Second Case. Slut when 16 months old showed change in her disposition. She is quiet, remains alone in corners, has convulsions characterized by generalized shakings without loss of consciousness. Soon she has become very nervous, acts peculiarly, scratches along the walls for hours. Hydrophobia is feared by the owner. Veterinarian is called. The dog then walks staggering, has tendency to drop on the left side when in motion. The patellar reflexes are exaggerated. No paralysis, no amyotrophy. Feels pain when inflicted. She sees and hears. Has gluttonous appetite. She is cross, growls but not bad. No muscular or twitching jerks. Intelligence diminished. Does not recognize her master; since some time has become very dirty, dropping her feces and urine anywhere. These symptoms gradually grew worse, and the animal died when twenty-two months old. The histological lesions were those of meningo-cortical inflamflammation.—(*Rec. de Med. Veter.*)

Uterine Fibro-Myoma of a Cow [*Dr. Bidault, Army Veterinarian*].—This was found when the cow, about 10 to 12 years old, was slaughtered. No history of the case. The growth occupied the enlarged cavity of the uterus, giving to the organ a globular aspect. There was hypertrophy of the uterine walls. The neoplasmic mass had a regular spheric form, measured 32 c.m. in diameter and weighed 30 kil. 500. It was almost loose in the cavity of the uterus, attached to the mucous by fibro-vascular adhesions. Enormous as it was, the tumor was single and without peduncle. The histological examination proved it to be a fibro-myoma.—(*Rec. de Med. Vet.*)

LARGE OSSIFIED COSTAL CHONDROMA GENERALIZED TO THE PLEURA IN A COW [*Prof. G. Petit and Adjunct R. Germain*].—This was observed in a cow, which had a swelling on the right thoracic wall, on a level with the inferior third of the fourth, fifth and sixth ribs. This gradually increased in size and soon assumed the appearance of a tumor as big as a child's head, which was pushing against the shoulder. The animal was tuberculined without results. Considered as incurable, she was then killed. *Post mortem:* Besides the presence of generalized pleural lesions consisting in a great number of small tumors varying in size, some translucid, gelatinous in consistency and others with characters of cartilaginous tissue and here and there in their center hard, yellowish deposits. The lungs were free from disease. The primary neoplasm consisted of a round mass, irregularly bosselated, weighing 8 kilog., 20 cms. thick and 30 high. It had two portions, one extra thoracic, bilobulated, only one visible during life; the other intra-thoracic was spread downwards on the sternum, extending forward of the fourth rib and backward of the sixth. The general aspect was characteristic of chondroma.—(*Bullet. de la Soc. Cent.*)

LIPOMA IN A DOG [*Adj. Prof. Douville*].—Six-year-old fox-terrier slut two years previously had a tumor in the region of the loins, which since has grown and forms now a hemispherical mass, as big as a man's head entirely painless. It gives the dog a deformed appearance and notwithstanding its enormous dimension, the dog does not seem otherwise troubled with it, except that she is less active and has difficulty in moving about. The mass began on the loins and extends to the base of the tail. Its lateral faces are continued to the external one of the thighs. The neoplasm is attached to the croup, is elastic and fluctuating. A lipoma is diagnosed, and a surgical operation is the only treatment advisable. Notwithstanding the danger of such interference, the owner wants it, as the condition of the animal is such that it is not possible to keep her. After preparation of the patient and intraperitoneal chloral anesthesia, the skin is easily dissected out, but the fatty tissue of the growth renders impossible its entire removal from the gluteal muscles. An artificial dissection has to be made to remove by layers the whole of the fat accumulation. Four pounds were the weight of the growth. Abundant hemorrhage interfered much with the operation, but easily controlled. The dog died twenty-four hours after the operation from traumatic shock.—(*Rec. de Med. Vet.*)

Rupture of the Uterus in Slut—Peritoneal Resistance [*Same Author*].—Eight-year-old slut has abdominal dropsy, well marked. An abdominal explorating puncture gives escape of two litres of clear fluid, reddish, odorless and albuminous. Its evacuation permits bimanual exploration of the abdomen, and a hard, immobile mass is detected, principally on the right flank. An explorating laparotomy is advised, and the owner consents. When the abdomen is open, a rush of liquid escapes and exposes near the posterior face a mass as big as the fist, covered with omentum, which when removed is found to contain a foetus at term. Another foetus is found, engaged towards the body of the uterus, while the right horn of this organ has a large rupture partly closed by fibrinous deposit and thickened omentum. A further examination reveals the right of liver covered with fibrinous deposits, which was torn off carrying away little pieces of the liver. The abdomen was then dressed and closed with special dressing. Three days after the slut died. Port mortem revealed extensive and severe peritonitis and a third foetus macerated and enveloped in a pouch of the omentum.—(*Ibid.*)

GERMAN REVIEW.

Salvarsan and Its Administration in Murrain in the Russian Army [*Professor I. Gordsjalkowsky in Journal Veterinary Wratsch, 1912, Nos. 18-20*].—The use of salvarsan on horses of the Russian Army was first introduced in January, 1911, by Dr. L. Liniszky. He had applied this product previously in twenty-three cases with perfectly satisfactory results, although injection was made subcutaneously.

In order to examine the therapeutic effect after injection into the blood, various experiments were made on the horses of the Fifth Cavalry Regiment, in which the murrain had been spreading rapidly since October, 1911. For this purpose Professor Ehrlich supplied the author with 128 grammes gratis, which kindness was appreciated very highly. The results obtained were as follows:

Signs of unrest were noticeable in but a very few cases; after injection respiratory difficulties became apparent; no swellings appeared at the points of injection. In all cases signs of weakness in various degrees were observed, which sometimes manifested themselves in a desire to lie down. The horses showed uneasiness, frequently changing their positions. With several,

the temperature increased after two to four hours, but, as a rule, after several hours this uneasiness disappeared. In all 50 horses were treated, the injections being made in the first stages of the disease; in four cases on the day the horses were brought to the hospital, which was immediately after detection of the malady; in 35 cases on the second, and in three cases on the third and fourth days.

As is usually the case, the registered temperature was 104 degrees Fahrenheit to 105.8 degrees Fahrenheit, the respiration 30 to 40, and in some instances rales of the pleura could be distinctly heard. Various parts of the lungs were affected, the pulse increased from 70 to 80, and all signs of pleuro-pneumonia were distinctly perceptible.

All clinical data and observations recorded by the veterinarians Linizky and Woskressensky show that the temperature usually fell after six or eight hours, except in one fatal case, and after 48 hours was again normal, at the same time the inflammation of the lungs and pleura disappeared. In some cases the action of salvarsan was marvelous. One horse was breathing very heavily, his forelegs outspread, the vesicular murmur in the lower third of the lungs was completely lacking, the rales plainly noticeable, and all symptoms of a malignant case were apparent. The injection was made at 10 p. m., 72 hours after the appearance of the disease, the horse showing a temperature of 105.3 degrees Fahrenheit at the time. The following morning it had declined to 100.8 degrees Fahrenheit, the rales were becoming less distinct, soft vesicular breathing was restored. In six cases repetition was necessary, as the temperature, reduced by the first injection, after two to four days again rose to 104 degrees Fahrenheit. These horses were first treated with two grammes of salvarsan and the second time with one gramme, which proved to be sufficient to insure complete recovery. Other horses whose symptoms were less severe were given smaller doses varying from one to one and a half grammes. In these cases after a slight recovery, a partial relapse occurred which necessitated a repetition of the injection whereupon rapid recovery resulted.

In order to determine the rate of the reduction of the fever, the temperature was taken at intervals of two hours with nine horses exhibiting high temperature and severe symptoms. It was determined that after two hours the temperature of several horses declined a few tenths of a degree, in other cases, however the temperature increased to 105.8 degrees Fahrenheit and more,

which, however, in six cases dropped from one to two degrees in six to eight hours. The temperature of two horses sank in the same measure within 24 hours. In one case, however, the temperature increased and reached 108 degrees Fahrenheit after four hours with the result of the death of the horse later.

It should be mentioned that this horse, like the others, received an injection of three grammes salvarsan, which is the largest amount of salvarsan used during these experiments. This leads to the belief that blood poisoning took place owing to anaphylaxis. This was the only fatal case among the horses treated with salvarsan. The doses tolerata for the average young cavalry horse, weighing 25 pud—1,100 pounds, should not exceed two grammes. In cases where complete recuperation does not result, it would be advisable to repeat the injections after the elapse of from 24 to 48 hours. Owing to the treatment with salvarsan, the pleuro-pneumonia was eliminated, which was not the case with the other methods of treatment applied in the very same regiment and during the same epidemic. The author, as well as other prominent Russian veterinarians, consider salvarsan a specific remedy for pleuro-pneumonia in horses. It is advisable not to reduce the dose of salvarsan and it is recommended to give the injections right from the start, using a solution in the proportion of 1 : 500, which must be intravenously.—(*Tierärztliche Wochenschrift, September,* 1912.)

The Effect of Salvarsan on the Cause of Infectious Abortion [*Dr. Francesco Favero, in Parma*].—The experiments were made on dogs. The animals were injected with 10 c.c. of virus into the peritoneum and either simultaneously or during the time of incubation or finally at the height of the infection with the dose of 12 c. gr. salvarsan per 1,000 gram body weight. The solution of the latter was injected intravenously. It was demonstrated that if virus and salvarsan were injected simultaneously, the disease could not manifest itself at all. Whilst when salvarsan was administered at the time where already numerous trypanosomæ were present in the blood, the trypanosomæ disappeared the day after the injection. A dog, moribund, recovered after the injection of salvarsan and was in good condition after 20 days. In conclusion, the author says that intravenous salvarsan injection, with dogs, has a powerful action on *Trypanosoma equiperdum* in preventing the infection when injected simultaneously with the virus or during the time of incubation, or later injected after the appearance of the parasites in the blood destroys these speedily.—(*Tierärztliche Wochenschrift, September,* 1912.)

BREEDING PROBLEMS.

ANIMAL BREEDING AND RELATION OF AGRICULTURE TO VETERINARY MEDICINE.*

By JOHN F. DEVINE, D.V.S., Goshen, N. Y.

The word " breed " brings to our mind different terms which are applied to man, animals and plants to denote the same idea. We speak of men as a race, of domestic animals as a breed, and of wild animals or plants as a specie or variety. When we speak of an animal as being " pure-bred " we mean to infer that it has been bred along lines that so fixes its type as to give it power to transmit certain characteristics to its progeny. The most obvious fact about living beings is their variability. Not only do species differ from each other by many and widely different characters, but individuals within the species are distinguished by what is readily discernible at least by the trained observer. However, to the trained eye there are characteristics in different breeds of animals which are very apparent even at first sight. To illustrate: One who is familiar with the various breeds of cattle could readily pick out the Holstein from the Durham, or the Durham from the milking strain of the brown Swiss. Likewise one could readily differentiate between a Guernsey and Ayrshire, or a Jersey and Guernsey, even though there is great similarity in the size and in a way in the general make-up of the three former and of the three latter breeds. This is equally true in the equine family. A practical horseman could tell at a glance the difference between a hackney and a thoroughbred, and so on with the various breeds of other animals, such as sheep, pigs, dogs, etc.

It is true that environments and geographical conditions have considerable influence upon the characteristics of a race or breed, but environments are perhaps not of such vast importance as some would have us believe. As an example of this we might cite the characteristics of the Hebrew whom we are told was " doomed to wander the earth " and is found in most all climes and mingling with all classes, but still has through all these years maintained his individual peculiarities, particularly as to facial form and characteristic nature.

* Written for AMERICAN VETERINARY REVIEW and read before the Veterinary Medical Association of New York City.

We who are interested in the breeding of animals should first determine the kind of animals that we wish to breed, and in determining that we should take into consideration local conditions, markets and the like. If we have in mind the breeding and rearing of horses we should breed and rear the kind which is best adapted to our locality, to our soil and to the market. To illustrate: There are certain sections of New York State that seem to have been adapted to the raising of the hackney and the hunting horses. I refer principally to Livingston County. Here conditions seem to be right for the proper training of the hunters, and custom has established a market where people in search of such class of horses are apt to go. Consequently, the raising of the heavy draft horses in this locality would not seem advisable or good business sense. Again, there are other localities of the State, particularly Orange County, that have been noted for a century or more for the breeding of trotting horses. Here the natural grass lands and the improved race-tracks have made it a spot where those in search of high-class trotting animals wend their ways. And then again another section of the State, possibly a little rougher in character, would be best adapted for the raising of heavier horses. Like conditions would also be necessary for those to consider who would be interested in the breeding of pure-bred cattle. In our natural grass lands, near milk depots where the methods of marketing milk are improved and handy, it would not seem good judgment to raise and care for the Ayrshire or Channel Island breeds. Again, if we were in a locality where the land was considerably hilly and the pasture not so plentiful, it is a known fact that one of the hardier and lighter breeds, such as the Ayrshire, would be more adapted and perhaps more profitable for such localities.

In selecting a breed it is first necessary that we choose the right kind of animals to breed from. For instance, we would not choose a mare or stallion with badly curbed hocks or congenital ringbone or with faulty conformation; particularly in breeds of animals in which conformation means so much. Neither should we choose a cow of an objectionable type unless she is known to be of special individuality from a productive standpoint. Neither should we head our herd with a bull that is the son of an unknown dam.

After we have decided upon the breed most adapted to our wants let us remember first, last and always to stick to that breed unless we have very positive reasons for changing. At any rate do not attempt by cross-breeding to improve our wants, since

theoretically cross-breeding seems very inviting to the misinformed, with the hope perhaps of improving the size of the Jersey or butter fat of the Holstein, which in reality might be done in an occasional instance, but the offspring of such individuals if carried on is apt to lead us to ruin. If we wish to improve the qualities we should do so by selecting individuals of the same breed to accomplish our desire. We should also bear in mind that it is not well to breed animals that are too young. The reason for this is plain if we stop to consider. The immature animal requires the added amount of nutrition that is available in the body, in addition to that required to sustain life for the proper growth and development of that body, and, therefore, to ask of the young animal the maintenance and proper growth of the embryo at a time when its body is still exacting certain nutrition for proper development, is unwise and unreasonable. It is the exception rather than the rule that we see the first-born of parents extremely young as remarkable in the things that go to make up merit either in the human or animal family, as we do those born at a time when parents are more matured.

This leads us to the proper nourishment of the young during the period of gestation. Unfortunately in the past the average breeder has not given the necessary attention to the pregnant animal. It has been the supposition that the straw stack was quite good enough for the pregnant dairy cow or the brood mare, when as a matter of fact the mother that is expected to nourish the unborn young and at the same time maintain a strong physical condition of the body should receive as much attention at that time, in the case of a brood mare, as if she were performing regular work, or, in the case of a cow, as if she were producing in a dairy. We should never lose sight of the fact that if we wish to have our young stock come into this world in a healthy condition, ready to start a vigorous growth, the mother of such animals must be properly nourished during the period of advanced pregnancy. If our various animals were kept on proper rations and received proper amount of nutrition during the last few months of pregnancy, instead of being allowed to decrease in vitality, the serious complaints of our breeders, of the loss of calves, loss of colts and loss of lambs, would be reduced greatly. Let us assume that there has been brought into the world a young animal, bred from proper parentage, vigorous in body and in constitution; we should immediately begin to give such attention to that animal as to produce a strong, healthy growth, since much thought to the future of an animal of quick development depends

largely upon its condition at birth and the subsequent attention for the first year or 18 months.

The burden of instructing stock owners as to the proper rations and nourishment for working animals and growing the young has been taken up largely by our excellent agricultural schools and experiment stations. Very useful information as to the value of different food stuffs and the compounding of balanced ration with the relative requirements of different animals is plainly put forth in the bulletins issued by such institutions. But, as agriculture has advanced, the duties of the veterinarian in instructing stock owners in sanitation and prevention and cure of diseases of their animals has constantly increased until to-day the services of a well-trained veterinarian is rightfully sought in even the very rural districts of most states.

Believing that the short review of the history of veterinary medicine might be interesting particularly to the younger men, I have attempted to compare the positive relation of veterinary medicine to that of agriculture. One does not need to be a Methusaleh to remember when veterinary medicine was practised in this country almost exclusively by the charlatan, but as the value of domestic animals increased and their worth became more and more appreciated, attention was slowly turned to guarding their health and adding to their comfort and usefulness.

Prior to the establishment of a Veterinary College in New York City in 1857, our graduated veterinarians were of necessity those from foreign shores. They were few in number, and the treatment of livestock was largely in the hands of blacksmiths or other laymen, who, in some cases, professed to be endowed with supernatural knowledge of animals and their diseases. However, it was fortunate at this period that there were some men with good judgment and sincere purpose, who took an intelligent interest in the study of anatomy, physiology and materia medica. To this class of men we owe much, as they honestly attempted to relieve the suffering of the dumb brutes, and if their efforts were of but little avail, they served a purpose by indirectly pointing out to the owners of livestock the advantage of even a little accurate knowledge in the prevention and treatment of diseases.

After the establishment of our Veterinary Colleges in this country, the value of graduated veterinarians who were scientifically trained in the treatment of domestic animals, as physicians were in the treatment of human diseases, soon became apparent, and I believe it can be truthfully said that no profes-

sion ever made greater strides than has the veterinary profession during the last quarter of a century. This has been made possible by the establishment of properly equipped Veterinary Colleges where the fundamental principles of anatomy, physiology, pathology, bacteriology, chemistry, botany and materia medica and like subjects are properly taught. Another very important factor in the advancement of veterinary science has been the enactment of state laws seeking to prevent the empirical practising of the past. Without such laws this state would be infested with armies of unprincipled impostors who would prey upon the public, which would not at all times be able to differentiate between the regularly licensed and qualified men and the unscrupulous, dishonest and ignorant fakers. These laws not only protect the public directly, but indirectly make the profession more inviting for men of higher moral and intellectual qualifications.

To practise veterinary medicine in this state (New York) one must now register in the county in which he wishes to practise. In order to be eligible for such registration it is necessary that the applicant successfully pass the State Board of Regents. To be qualified to enter into such an examination one must be the possessor of a diploma conferred by a recognized Veterinary College, the full course of which must cover three periods of at least six months each. The entrance requirements of such a college is an academic diploma or its equivalent.

The veterinarian of to-day, we have said, should be a man who can give valuable advice in regard to the care and health of animals, and in addition he should be a man who is capable of coping with sanitary questions that might involve great loss to our enormous investments in the livestock of our state, or possibly be transmitted to the human family.

In reminiscencing I well remember when a boy on the farm how I looked with boyish terror to the occurrence with regular frequency in our herd of "hollow horn and wolf in the tail." This was equally true of the cows that "lost their cuds." To-day as most of our animals are dehorned, the fellow with the gimlet and turpentine has lost his job, but I believe there is still occasionally a cow that is affected with "wolf in the tail," particularly if you go into the extreme rural district where there is a fellow with a sharp knife and some pepper and salt handy, with nothing much else to do.

I remember vividly when I first began the practice of veterinary medicine that I was called one day to stop a hemorrhage which had been caused by a family pet horse stepping on one

of its extremities with a sharp heel caulk. After I had stopped the bleeding and dressed the wound, the owner was very grateful. "Young man," he said, "I wish to tell you something that I feel will be of use to you all your life. You know cows sometimes lose their cuds." (I knew very well that they did not. However, I did not feel justified in stopping him in the midst of his friendly advice.) He then told me of a sure cure, and it was this: "When you get a cow that has lost her cud, if you can find a yearling near by that is chewing hers, reach into the yearling's mouth, grab her cud and give it to the old cow, and she will be cured immediately." I then asked him if it were a fact that cows lost their cuds, where would the yearling get another. It seems that this argument had never occurred to him.

We know to-day from our knowledge of physiology and anatomy that ruminating animals do not thoroughly masticate their food when they first eat it, but swallow it hurriedly and it goes down into the first stomach or paunch, and later they regurgitate it to be remasticated at leisure, and it then passes into the second, third and fourth stomachs for digestion, absorption and assimilation. Therefore, one of the first symptoms of any ailment in a cow, let it be what it may, is quite apt to be cessation of regurgitation, or "chewing her cud," as it is called. It is therefore classified as a symptom only, which is equally true of a cow with cold horns or extremities or a flaccid tail. We all know very well that ofttimes simple ailments, such as a cold or the Grippe will cause our extremities, hands and feet, to become cold; in fact this is one of the first symptoms giving evidence of disturbed circulation. These symptoms mean nothing definite in themselves, but are to be taken into consideration with other clinical conditions by one whose training and observations find significance in their presence or absence.

The first thing usually sought for by the scientists is a correct knowledge of things as they are in the normal, so to speak. By the knowledge of the normal we get a starting point from which to trace the abnormal. This is equally as true in the art of medicine and veterinary medicine, and points out to us the harm in many ways that may result from the empirical dosing of animals. There is no question in my mind, but that many a valuable animal has met an early death due to the overzealous dosing of aconite, the treatment destroying the only chance that nature might have had in overcoming the ailment.

Again how often has the rural practitioner been called to treat the pride of the dairy and finds her down with what is

commonly called milk fever. (This is a misnomer, since this is not a febrile condition.) He secures the animal on her side, properly disinfects the udder and surrounding parts and, with a sterile apparatus and with all possible care to guard against infection, proceeds to administer the oxygen treatment. During this time he has probably been advised that some well intended but badly informed individual has administered the sure cure drench, which, owing to the paralysis of the throat and inability to swallow, has been poured directly into the larynx, the trachea and lungs. The animal makes a gratifying recovery from milk fever and dies in due time from mechanical pneumonia.

Those of you with experience could of course recite volumes of instances of this kind, where lack of knowledge has cost stock owners the lives of many of their valuable animals, but the young men who are entering the veterinary profession to-day will have but few of these vicissitudes to contend with. Times have changed; the owners have come to believe that the rules set forth by capable veterinarians and the advice not to drench animals unless they are positive in their diagnosis and treatment is sound judgment. I think we are justified in saying to the laymen: If you are guessing let nature take a hand. She will beat you out nine times out of ten.

Philippine Civil Service Examination, Agricultural Inspector (Male), December 11-12, 1912.—The United States Civil Service Commission announces an open competitive examination for agricultural inspector, for men only, on December 11-12, 1912. From the register of eligibles resulting from this examination certification will be made to fill four vacancies in the Philippine Service, at entrance salaries of $1,200 and $1,400 per annum, the majority of the vacancies being at $1,400 per annum, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Applicants should at once apply to the United States Civil Service Commission, Washington, D. C.

Each applicant will be required to submit with his application a photograph of himself, taken within three years, which will be filed with his papers as a means of identification. An unmounted photograph is preferred.

CORRESPONDENCE.

THE KANSAS HORSE PLAGUE.

FORT COLLINS, COLO., NOV. 16, 1912.

Editors AMERICAN VETERINARY REVIEW, *New York:*

The disease in Kansas and a few surrounding states, which killed many horses during a period of about two months, has abated and speculation is rife as to what it really was and what caused it. One thing is certain, there was a low percentage of susceptibility and a high degree of mortality and there is no reason to assume that the future is exempt from equally disastrous visitations. A disease simulating this one has in the past appeared sporadically, as most veterinarians can testify. These outbreaks have by assumption, because of apparent uniformity in symptomatology and etiology, been placed in one category—cerebro-spinal meningitis, due to forage poisoning.

The extent of the recent outbreak stretches this assumption to the breaking point and we are forced by the accepted standards of laboratory investigations to withhold judgment as to the causative agent in this case until some definite experiments have afforded us some foundation for our faith in this assumption. Among other things, animal inoculations made at Holly, Colo., have given such positive results as to lead us to assume that in all probability it is caused by a specific micro-organism and that the results thus far obtained warrant further investigations along this line.

GEO. H. GLOVER,

VETERINARIAN GOES TO LEGISLATURE.—Dr. E. E. Bittles, of New Castle, Pa., a graduate from Toronto in 1890, was elected to the Pennsylvania Legislature at the last election.

OF GREAT INTEREST TO PRACTITIONERS.—After carefully reading Dr. F. N. Sawyer's report of three years' experience with phylacogens on page 273, in which he deals with the philosophy of that form of therapy, practitioners will find interesting data in the doctor's detailed report of fourteen cases treated by that method on page 334.

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular monthly meeting of this association was called to order by President Berns in the lecture room of the New York-American Veterinary College at 8:30 p. m., November 6, 1912.

Dr. McKinney, chairman of the prosecuting committee, reported that a certain man goes about injecting something into the shoulders of horses, and guarantees a cure in any case of lameness. The doctor had this party arrested and he is now out on bail, the trial to come up in the court of Special Sessions week of November 10. Dr. Pendry, of Brooklyn (formerly a veterinarian, now practicing law), had been retained to prosecute the case.

It was recommended that we try to get better laws, and it was also stated that we now have a veterinarian in the Assembly.

Dr. Childs presented a canine patient, a black pomeranian, with a cleft palate. The history of the case was that the dog coughed and regurgitated food through the nostrils. Was first noticed about September. Dr. Childs requested that some one suggest treatment for this case.

Dr. Killilea (M.D.) replied that the palate could not be closed unless a hypoplastic growth was produced.

Dr. Schlessinger stated that if it were scarified, sutured and treated with nitrate of silver it might cause the parts to unite, as he considered it sufficiently far back to be beyond the hard palate, but gave a grave prognosis.

The chair asked if it is a commonly recognized condition.

Dr. Schlessinger answered that it was, and Dr. Clayton said that it is not an uncommon condition. Dr. Crawford said that it is quite common, and that he had a case at the present time. He follows Hobday's method of scarifing and using silver nitrate.

Dr. J. F. DeVine, of Goshen, N. Y., read a very excellent paper entitled "Animal Breading and the Relation of Agriculture to Veterinary Medicine."

Drs. Clayton, T. E. Smith, Ackerman, Schlessinger, Mc-

Kinney and Nichols entered the discussion of this interesting subject.

Some of the points brought out were as follows; viz., colors usually are the result of prepotency, but markings are more apt to follow than solid colors.

In old mares that are bred ovulation ceases after being bred, therefore mares bred regularly do not as soon become senile as those bred late in life.

The question "Should we keep up our pure breds?" is answered that it is better to breed the size you want of pure breds than to cross to get the kind of animal wanted.

On the whole pure breds were favored in preference to grades or cross breds.

The question was asked "Can the common draft horse be profitably bred in New York State?" This depends on the locality. In the northern part of the state good corn and mixed hay are raised, and it is considered profitable to raise these horses at the present time.

Dr. L. Greissman then read a paper entitled "New York's Equine Plague." This article was productive of quite an animated discussion of the glanders question in its present stage.

Dr. Ackerman opened the discussion and stated that he believed that 15 per cent. of the horses of this city, if tested, would be found to be glandered. He recommends the destruction of all reactors. Also mentioned the public watering trough and horseshoeing shop as factors in disseminating the disease.

Other members expressed the opinion that even a higher percentage than that given by Dr. Ackerman would be found glandered on test.

This discussion was continued at some length.

Dr. Robert W. Ellis stated that it was his opinion that glanders should be regarded as a scourge, in which radical methods should be used for its control and eradication. He stated that to be successful it would have to be state-wide and that a systematic inspection would have to be carried on simultaneously in every county of the state, even though it be necessary to have a veterinarian in every county and deputies to the county veterinarian where the size of the county or its horse population demanded it. These deputies to be responsible to the county veterinarians, and the county veterinarians to be responsible to the chief veterinarian, who would in turn be responsible to the Commissioner of Agriculture for the proper carrying out of whatever measures were adopted. He believed that the mere removal of

cases as they appear entirely inadequate and favored a plan that would include general state-wide systematic *inspection* in every county in the state at the same time.

Dr. Kingston stated that a high percentage of the stables are not clean and questioned if it is right to take out a few horses on clinicial symptoms and the mallein test and leave the others under the same unsanitary conditions.

It was also stated that some unscrupulous veterinarians are in the habit of testing horses and sending reactors through the public sales.

Dr. Ackerman stated that the Commissioner of Agriculture intended calling a meeting or conference of veterinarians to hear their views on this important subject.

Dr. Mangan stated that he believed vaccine is of great value as a prophylactic agent in glanders if produced from the strain of organisms found in stable in which it is to be used.

Dr. Maffitt Smith reported a suspected case of glanders in a man.

Dr. McLaughlin moved that a committee be appointed to investigate this case; seconded and carried.

The chair appointed the following members to act on this committee: Drs. McLaughlin, Smith, Schlessinger, Ellis and MacKellar. Dr. Killilea (M. D.) was requested to act as consultant.

Dr. H. D. Gill stated that in his opinion glanders should be handled as a dangerous scourge, and moved that Drs. Ellis, Mangan, Foy, Cochran and Clayton be appointed as a committee to devise plans for the control and eradication of glanders in this state, and submit the same to the Commissioner of Agriculture. This committee to report to the association in the near future, seconded and carried.

A vote of thanks was tendered Drs. DeVine and Greissman for their contributions to the program of the meeting.

Meeting adjourned subject to the call of the chair.

R. S. MacKellar,
Secretary.

Special Meeting.

A special meeting of this association was called to order by the president November 18, 1912, at 5:30 p. m., in the lecture room of the New York-American Veterinary College.

Dr. Berns explained that the object of this meeting was to receive and act on the report of the special committee appointed

to devise ways and means for the control and eradication of glanders in New York State.

Dr. Ellis, chairman of the committee, stated that the full committee had held a meeting in his office on the evening of November 8, 1912, and drafted some recommendations to be submitted to the association for their approval.

These recommendations were read by the secretary, and after being modified in some respects were adopted.

The following members were appointed as a committee to present these recommendations to the Commissioner of Agriculture for his consideration and attend the conference on tuberculosis and glanders to be held in Albany, N. Y., November 19, 1912: Drs. Berns, Ellis, Cochran and MacKellar. Meeting adjourned.

R. S. MacKellar,
Secretary.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the M. V. M. A. was held at Hotel Coburn, Skowhegan, October 9, 1912, at 7:30 o'clock, with the president, Dr. Wescott, in the chair.

Among the members present were: Drs. Wescott, Lynch, Purcell, Stevens, Robinson, Russell, West, Newton, Joly and Salley. Dr. H. N. Eames was a welcome visitor. The legislative committee not being present, no report was made. An interesting report of the last meeting of the A. V. M. A. was given by Dr. Robinson, who was the delegate from this association.

New Members.—Drs. Charles Lorin Ryan and Henry Bennett Wescott having been favorably reported on were unanimously elected to membership. The application of Dr. Harold N. Eames was referred to the executive committee.

Nominations for State Veterinarian.—As there were more than one candidate, the president suggested that a bollot be cast, this was seconded and carried, and the result gave Dr. A. Joly the ballot.

It was then moved and seconded that a committee be appointed to wait until Dr. McGillycuddy to convey condolences and good wishes and to acquaint him of the fact that he had been unanimously elected to honorary membership for the remainder of his life.

It was then proposed, seconded and carried, that the president be reimbursed, out of the founds, the amount of ten dollars ($10),

paid by him to Dr. Simpson after the Portland meeting, and that Dr. Salley be authorized to send the president that sum.

It was further moved, seconded and carried, that a committee of three be appointed to arrange a banquet for the next meeting, which is to be held at Augusta; Drs. Blakely, West, Wescott and Robinson were duly appointed.

The meeting was then by mutual consent adjourned, and an impromptu discussion was held in regard to impending legislation.

DR. C. W. WATSON,
Secretary.

LOUISIANA VETERINARY MEDICAL ASSOCIATION.

The semi-annual meeting of above association was called to order at New Iberia, October 2, 1912, by President Douglas, who introduced Mayor J. S. Power, of New Iberia, who gave an address of welcome and a very interesting talk.

Dr. Dalrymple responded to the address of welcome in his usual amiable and competent manner, mentioning our standing as compared with other states.

In the evening the association was banqueted by the municipal authorities and Board of Trade at one of their splendid club houses a few miles from the town, the trip being made in automobiles.

In the morning of the next day we were entertained by a visit to the Avery salt mine, one of the notable mines of the world, and found more salt than our patients could lick in 24 hours. We all brought a little salt from the mine to keep down any freshness that might arise.

In the afternoon several valuable papers were read, one by Dr. Cambon on "Hydrophobia," and another by Dr. Flower, "The Veterinarian as a Sanitarian."

At night Dr. Dalrymple gave a lecture on "Milk Hygiene," with stereopticon views, and packed the Opera House to its capacity with "standing room only" sign exhibited.

This is the first attempt that we have made at a semi-annual meeting. Our plan for the future is to have a meeting in New Orleans in the winter and one somewhere in the country in the summer.

HAMLET MOORE,
Secretary.

NEWS AND ITEMS.

Dr. Liautard Receives Call From One of His Students.—Dr. Robert W. Grutzman, class of 1896, A. V. C., called on Dr. Liautard in Paris in October. It is needless to say that Dr. Liautard was glad to see him. After visiting Dr. Liautard, Dr. Grutzman went to Germany. where he was to meet Dr. Schwarzkopf.

Dr. Clell Bricker Perkins, Centerburg, Ohio, was married November 18th to Miss Flo Vaughn Burrell, of Croton, that state. We are sure that the doctor has the good wishes of all the veterinarians in the Buckeye state and of all others that know him. The Review wishes him success and happiness in his new estate.

Surrenders to Cupid's Battery.—After a courtship of twenty-four years, Dr. Patrick Burns, of New York City, was married on October 24 to Miss Rose Hayes. The Review congratulates the good doctor in having been able to find the right word at last by which to make himself clear to the young woman who has consented to be his life partner, and feels sure that he has much the better of the bargain; although we can congratulate Mrs. Burns on the fact that she has one of the best fellows in the world for a husband.

The Illinois State Veterinary Medical Association—A circular letter issued by Secretary Merillat, after our November number was out, gives a very attractive outlook for the coming meeting on December 5th-6th-7th, and every veterinarian who can possibly do so should avail himself of it. The International Live Stock Exposition and the annual meeting of the U. S. Live Stock Sanitary Association, which precede the Illinois State Veterinary Medical Association meeting, makes Chicago an attractive place the first week in December.

Would Amend Agricultural Law.—At the request of a considerable number of people and several organizations, Commissioner Calvin J. Huson called a conference on glanders and tuberculosis in the Assembly Chamber at Albany, November 20. It was the commissioner's desire to have every possible interest represented. The tuberculosis question proved such a big one that the subject of glanders was not reached, and it is the commissioner's intention to call a conference in New York City to consider glanders alone, in the near future, as he is deeply interested in the matter.

AMERICAN VETERINARY REVIEW.

JANUARY, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, November 15, 1912.

INTERNATIONAL CONGRESS OF COMPARATIVE PATHOLOGY.—When the following will arrive before the readers of the REVIEW it will be two months since the event will have taken place. A reference to the dates when this international congress (first of its kind) occurred and the time my chronicle must leave here to be in time across the Atlantic will explain my notice only coming out to-day.

Opened on the 17th of October, the first *International Congress of Comparative Pathology* from the first day proved to be a very successful meeting. The number of present registered 1,200, a figure that (generally speaking) is very seldom realized on similar occasions.

Since ten years that the Society of Comparative Pathology has existed it has been only on that last occasion that with the noble and persistent efforts of its General Secretary, Veterinarian Grollet, that it has succeeded in gathering together scientists, physicians, veterinarians and even botanists, coming from every part of the world, to bring together their knowledge on subjects of universal scientific importance.

It was indeed a truly international meeting, as in the list of members, among the many French names that were present at the opening was contained those of active members or of governmental delegates from Asia, South America, Belgium, Denmark,

Egypt, Holland, Hungaria, Italy, Norway, Portugal, Roumania, Russia, Switzerland, etc.

The Congress held its meeting in the great amphitheater of the School of Medicine, which on the day of opening was decorated with national flags and packed with scientists beyond imagination.

The ceremonial of opening was carried according to programme, which was well laid out. Professor Roger of the Faculty of Medicine and Professor of Experimental and Comparative Pathology, delivered his address and was followed by a member of the French Government, the Secretary of Public Instruction, who declared the session open.

The various governmental delegates also made speeches relating to the importance of the subject and the interest taken by their respective governments in the doings of the Congress, and the real work of the assembly began and lasted until the 23d of October, when it adjourned.

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To review the entire series of the reports presented would require more space than I can occupy in this chronicle and I must refer those interested to the valuable volumes published by the house of Masson & Co., 120 Boulevard St. Germain.

I may, however, call the attention of our readers to some of the reports as they were presented in the few days of the meeting.

On the first day the *parasites common to man and animals* were considered. The vermiform affections were treated by Professor Perroncito of Italy, Devé, Weinberg and Ch. Morot. Vegetal parasites were reported on by Prof. A. de Jong of Holland and Professor de Beurmann. The microbian diseases were considered by Dr. Nathan-Larrier.

On the second day the nervous diseases were reported on by Dr. Marchand and Professor Petit of Alfort at the morning session. And in the afternoon the subject of human and aviary diphtheria gave rise to a very important report, and communica-

tions from Prof. F. Arloing, Bordst of Bruxelles, de Jong and Rodet.

On the morning of the third day rabies was the subject under consideration, and was treated by Messrs. Dr. Luzzani Negri, Professor Babes of Bucarest, Dr. Remlinger from Tangier, Piot Bey of Egypt and others. The afternoon was occupied with vegetal pathology. Four reporters and a large number of communications filled up the entire seating.

On the Monday morning Dr. Ravenna of Modena and Garnier of Paris considered the comparative study of cirrhosis, while in the afternoon the pathogeny of tuberculosis was treated by Professor Calmette, Director Vallée, Professor Lignières and Mr. Chaussè. There were also a large number of communications from various members, Dr. Jong, Bruschettini from Genoa, Oceanu from Bucarest, Dr. V. A. Moore from New York, Dr. Sata from Japan, etc.

The morning session of the following day was occupied by Dr. Carrière and Tomarrin from Berne and N. Chaumier on variola and vaccinia. In the afternoon the pathology of the lower animals was treated by Perroncito; on bees and silkworms by Dr. Jugeat, and Dr. Morine of Ohio on fishes, etc.

Cancer was reported upon in the morning of the last day by Professor Memetrier and in the afternoon metaloscopy by Mr. Dubois, Sanitary Veterinarian.

A glance at this rapid mention of the work done at the Congress will tell not only how important the subject of comparative medicine is, but also of the general great interest that it has gained all over the scientific world. It is not because it is a new thing as one present at the inauguration was remarking that the Congress succeeded. No. It is because at last as science has progressed facts related years ago have become more and more recognized, and of greater importance in that ever immense open field of medical scientific inquiries.

* * *

HUNDRED AND FIFTIETH ANNIVERSARY OF THE LYONS VETERINARY SCHOOL.—The celebration of this anniversary took

place according to the programme which had been carefully prepared. It was a grand professional manifestation which, by an almost unanimous expression, was a magnificent success. Prepared since a long time by the regretted great veterinarian, Professor Arloing, who, already at the inauguration of the new school of Belgium, had invited all present in the name of the French Government to come to the festival of the anniversary of the first veterinary school and the bi-centennial of Claude Bourgelat, Arloing had then exerted all his efforts to make the celebration what he hoped he could do to glorify the memories of the celebrated founder.

Destiny ordered differently; Arloing dead, Director Faure, his successor, did all he could to continue the preparations and his efforts were well rewarded by the grand results in which participated a great number of schools from different parts of the world, delegates from various government and veterinary societies, civil and military veterinarians having brought to the celebration their full appreciation of the ceremonies of the day.

At the opening of the first day, October 26th, a very large number of official authorities, with the directors of the three veterinary schools of France, their staff of professors, the chief veterinarian of the army were present, and also delegates of the European countries: Dr. Eberlein, of Berlin; Olt of Giessen; Frick, of Hanover; Giesenhagen, of Munich; Veterinary Inspector Hanka, from Austria; Professors Dupuis, Meuleman, Degive, Bredo, of Belguim; Professor Bang, of Denmark; Piot Bey, of Egypt; Professor de Castro, of Madrid; Sir John McFadyean, of London; Stockman, of London; Mettam, of Ireland; Director Schimmel, of Utrecht; Professors Hutyra and de Ratz, of Hungary; Lanfranchi, of Parma; Perroncito, of Turin; Director Malm, of Norway; Professor Nogueria, of Lisbon; Happich and Negotine, from Dorpat (Russia); Professors Rieglez and Udriski, of Roumania; Kjerrulf, of Sweden; Professors Ducrot and Burgi, of Switzerland; even from the Argentine Republic; Dr. Theiler from South Africa, etc.

To this long list ought to be added the delegates of many scientific, medical and veterinary societies.

Many excellent speeches were delivered and then the entire programme, followed by a visit to the various buildings of the school, laboratories, etc., and the banquets.

The inauguration of the monument to Professor Galtier, a grand and respectful homage to Professor Arloing, having given occasion to speeches of admirable conception by venerable Professor Chauveau.

The inauguration of a marble plate to Sanitary Veterinarian Leclerc closed the series of those festivals, after a brilliant reception given at the Government Hall by the municipal authorities of the City of Lyons, and thus ended one of the most imposing ceremonies that the veterinary profession has ever organized.

Strange to remark that nothing is said in the reports to hand of the Museum of Professor Aureggio.

Is it not regrettable that the veterinary profession of America had no official delegates among those which had been sent from all over the world?

* * *

Intrarachidian Puncture.—The practice of lumbar puncture with its different applications is far from occupying in veterinary medicine the very importance place that it holds in human practice, and notwithstanding the satisfactory results which have been obtained and published by eminent masters and careful, conscientious practitioners the method has not become generalized.

The principal applications where it has found (so far) its use are as means to produce analgesia, as therapeutic injections or as means to reach a diagnosis. These have been the object of careful reviews, one by Adjunct Professor R. Lasserre, of Toulouse, and the other by Dr. Mattcini Rafaello, of Pisa, where these applications are successively considered.

Rachidian Analgesy.—First resorted to by Dr. L. Corning, of New York, in 1885, it found gradually its indication in human surgery, and then in veterinary medicine, when publications of experiments made by Cuillé and Sendrail, Podasca, Angelo Baldoni, in using cocaine injections were made between 1901 and

1905. Erhardt, of Germany, in 1908, reported the results he had obtained with solutions of tropacocaine, and finally Lichtenstern, another German veterinarian, published an important pamphlet on the same subject, relating the observations that he had obtained in its use in 28 cases by the use of solutions of stovaine and novocaine. For these authors this mode of analgesia is at the disposal of the most careful practitioner, is very simple, and far less dangerous than chloroform or ether, and besides has for country practitioners the great advantage that it does not require the help of any assistant.

In horses and cattle the entrance into the rachidian canal can be gained between the spinous processes of the lumbar vertebræ. But with these animals as in dogs the ideal spot is through the relatively large and easily reached space between the last lumbar vertebræ and the sacrum. A long, fine trocar, 11 to 13 centimeters long, or for small animals the needle of a syringe of Pravaz is with that syringe the instruments that are necessary. For large animals, a bistouri may also be at hand to make a little opening of the skin. The operation can be performed standing or with the animal cast. This is, however, safer and better, as it is then easier to reach the interspinosum foramen; the danger of having the instrument broken by struggles of the animal is reduced, the escape of a certain quantity of cephalo-rachidian fluid indicating that the needle has arrived at the proper place, and finally the effects of the muscular paresia remain without inconvenience, the animal being " in certain cases so quiet during an operation even very painful that he eats the hay placed before him," writes Lichtenstern.

The operation needs some careful attention, such as avoiding to puncture against a vertebræ and watching for the escape through the cannula of the trocar of a more or less abundant quantity of cephalo-rachidian fluid, which may be in drops or in a stream, clear or slightly colored by blood.

The solution must be injected slowly.

The anesthesia takes place in various times according to the strength of the solution, or the addition of substances likely to

retard the absorption of the anesthetic. The extreme figures have been between 3 and 30 minutes. It lasts between half an hour and two hours. No accidents can result from the operation. There is no danger whatsoever, when it is performed aseptically and that the spinal cord has not been wounded, an accident which is exceptional although serious when it occurs.

Rachidian analgesia finds numerous applications in veterinary medicine, write Caillé and Sendrail. "All the operations of the hind quarter or the abdomen, such as laparotomy, kelotomy, castrations, tenotomy, reductions of fractures or dislocations, operations on the rectum, the genito-urinary organs the foot, etc., can be performed under it.

* * *

Although this anesthesia can be of advantage and indicated in surgery, there seems to be no case in record when it was resorted to. On that account therapeutic injections are the only ones that are to be considered. At the origin, Leonhard Corning used it to overcome the very severe pains observed in some diseases of the spinal cord in man. Later on injections were tried in man for the treatment of tetanus. In fact it is principally in this disease that the greatest number of trials were made. Roux, Borrel and Courmont have reported a number of cases.

Sendrail and Caillé, Besnoit experimented with them also with various results. They consisted in a manifest reduction in the progressive and rapid aggravation of the disease after each injection and the conclusions that such treatment would be susceptible of bringing on recovery if it was practised as soon as the first sign of the disease appeared and particularly when the wound of introduction is on the hind quarters. And again the operation is simple, scarcely painful, can be performed with the animal standing and if necessary repeated several times.

Larthomas and Escoffier report a case cured with the injection of antitoxic serum. In Germany Lichtenstern relates the good results obtained by intrarachidian and intravenous injections of serum.

The injection of serum must be repeated. Antitoxic serum however is not the only agent used for the injection. Solutions of sulphate of magnesia have also been employed, principally in human medicine. Solutions of strychnine also. Two cases of recovery of paraplegia are recorded by the injection of solution of nitrate of strychnia gram 0.025 in 10 parts of distilled water.

It was expected that in the treatment of chorea these injections might be of advantage. Sulphate of magnesia was used in man and also in dogs. Reported favorably in man by Marinesco, it was not as satisfactory with Sendrail.

From the observations made it results that lumbar puncture with intrarachidian injections may be used advantageously in the therapeutic treatment of some diseases of our domestic animals, tetanus and paraplegia principally, and the results known deserve the attention and ought to stimulate new trials.

The last application of the lumbar puncture, diagnostic means, consists in the collection of some cephalo-rachidian fluid for examination to confirm a diagnosis. It has not yet entered into the domain of veterinary medicine. It is a chapter of semeiology to create in our branch of medicine.

* * *

Again the Surgical Treatment of Roaring.—That the object of Williams' operation for the relief of roaring consists in the removal of the mucous membrane which lines the laryngeal ventricle is now generally admitted as the best way to obtain the obliteration of that cavity and prevent the vibration of the paralyzed laryngeal cartilage, the arytenoid. The method recommended by Williams is well known, and the manner in which the result can be obtained seems to have various advocates.

The grasping instrument of Williams has given good results and several operators have obtained with it very satisfactory statistics. It has not had many objections that I know. However, Professor Cadiot has suggested in preference to the use of the Blattenberg burr to grasp, hold, twist and pull out the ventricular mucosa, a pair of forceps measuring about 25 centimeters

in length. The branches have at their end teeth of small size, they are slightly convex outward and provided with three hooks, the middle one a little stronger than the others. Introduced in the ventricle, the mucosa is taken hold of and by a double motion of twisting and pulling, it is gradually mobilized and brought out of the ventricle when it is made loose from the borders of the ventricular opening or cut off with scissors. Will this forceps do better than Blattenburg's instrument? I do not know.

* * *

In the *Veterinary Journal* there is on the subject of treatment of roaring in horses an abstract from a translation by Mr. Gladstone Mayall, M.R.C.V.S., of a clinical lecture of Dr. R. Eberlein of the Royal University Veterinary School of Berlin, from which I extract only the part which relates to the operation of excision of the laryngeal ventricles.

After all the primary steps of disinfection, securing the animal, opening of the larynx, etc., Dr. Eberlein says: "Introduce the index finger of the left hand into the left laryngeal pouch and by slight bending and lifting of the first joint of the finger stretch the dorsally situated vertex of the same at the joining place of the vocal cord, to the processus vocalis of the arytenoid cartilage. I then make at this place with the pointed or broad laryngeal knife a triangular incision, whose sides are only 1½ centimeters and of which one extends to the anterior edge of the vocal, the second to the ventral edge of the arytenoid cartilage. The incision only penetrates the mucous membrane. This is stretched here so that the incision gapes just a little. Now I lay the knife on one side, take out the index finger from the pouch and insert it into the triangular incision and push it slowly and rotating and boring slightly along the wall of the pouch and into its depth, whilst I follow the extent of the pouch in its direction to the crico-arytenoid cartilage joint. When I have reached the base of the pouch, which I can feel quite well, then I bend and turn the first joint of the finger against the base of the pouch whilst leaving the rest of the finger in the wound, thus loosening

the base by slight traction from its foundation and press it forward against the entrance of the pouch. By this procedure the pouch will be turned inside out and rest on the finger like a thimble. Now, I pass the button laryngeal knife into the wound, at the same time holding the pouch fast with the thumb, if necessary, so that it does not slip off the forefinger and separate the pouch completely, whilst I cut along the edge of the entrance of the pouch * * *."

No suture, no bandage are necessary. We fancy that at the time that the long clinical lecture of Dr. Eberstein was published in the German Archiv. the last improvement of Williams was not known to the learned director.

* * *

In Italy the subject has also attracted the attention of the skillful surgeons that are practising and among them Prof. D. Bernarlini of the Institute of Veterinary Pathology and Surgical clinic, who has written a concise pamphlet headed *"The Surgical Treatment of the Paralysy of the Left Vocal Cord of Horses,"* of which I have received a copy. Here also there is presented a concise consideration of the various proposed methods of treatment from the time of Gunther to that of Williams and after criticizing the last, in the manner with which the obliteration of the ventricle is obtained, Bernardini says that the destruction of the mucosa is to be obtained with cauterization.

"The animal without any preparation of diet, only secured in stocks, with the head raised and in extension, after disinfection with tincture of iodine and a previous alcoholic rubbing, an incision is made on the median line from the thyroid cartilage to the first tracheal ring, exposing the sterno-hyodeus and thyroideus muscles and under them the crico-tracheal ligament. This is incised transversely so as to permit the introduction of a tracheotomy tube. With the index acting as guide, the galvanocautery is introduced easily, passing between the vocal cords, and is brought in contact with the cavity of the laryngeal ventricle. The electric current is allowed to pass for ten seconds. A few

minutes are allowed to pass to permit the cooling of the instrument when it is removed." A Thompson tracheotomy tube is introduced and left for a few days. No further care is required, the cicatrization is quite rapid.

Bernardini believes that with this method even the large number of successful cases treated by Williams would be greater. Time and experiments may tell, but Williams' operation is so simple!

* * *

BIBLIOGRAPHY: *Handbuch der Vergleichender Anatomie der Haustiere* (Treatise of Comparative Anatomy of the Domestic Animals).—By Director Prof. W. Ellenberger and Prof. H. Baum of the Superior Royal Veterinary School of Dresden, published by Aug. Hirschwald n. w. Unter den Linden, 68, Berlin.

This is the thirteenth edition of the work. The preceding ones were after various authors. From the first to the fourth after Gurlt, the fifth Leisering and Müller, the sixth and seventh with Leisering, Müller and Ellenberger, the eighth by Ellenberger, Müller and Baum, the ninth, tenth, eleventh, twelfth and this last by the two authors.

This volume is a very large work of nearly 1,100 pages, with 1,078 illustrations, many of them being colored. It is divided into seven principal chapters, osteology and syndesmology in the first, myology in the second, splanchnology in the third, under which are included the organs of the thoracic, abdominal and pelvic cavities, and treating of digestion, respiration, circulation, urinary depuration, generation and with a special division for the consideration of the blood vessels, arteries, veins and lymphatic system. In the fourth chapter neurology, in the fifth the organs of senses, sight, hearing, smell, taste and touch, in the sixth the external tegument, the skin, and in the seventh the anatomy of birds.

As can be seen by these, the classification differs somewhat from that which is generally found in other works on anatomy, and the skin forms the subject of a special chapter.

The manner in which the descriptions are followed in the var-

ious chapters is the same, the anatomy of man finds a small place, sufficient to give a comparison with the principal object of the work; *viz.,* the comparative anatomy of horses, cattle, swine and carnivora. Each of them receives considerable attention from the authors, who give for every species a more detailed description than is generally found in veterinary works on anatomy. Each general chapter is preceded by generalities and considerations upon the development of the organs treated. There are among the many plates that illustrate the book, several which deserve special attention; *viz.,* those which I believe are reproductions from the work on the lymphatic system by Prof. A. Baum that I had the pleasure to notice in a previous chronicle. I refer to those which expose the distribution of the lymphatic system of the whole organism in cattle, the head, the thorax, the abdomen and the extremities. The coloring illustrating the circulatory system is very neat and must be of great help to the reader.

There are many other points of interest in *Handbuch der Anatomie der Haustiere,* and I regret that I canot go into greater details relative to the value of this new addition to German veterinary literature. Our *confrères* on the right side of the Rhine are all hard workers, they have already published many valuable treatises on anatomy and the names of Gurlt, Müller and Leisering are familiar to anatomists of all nations. Professor Ellenberger and Professor Baum have crowned the work done by their predecessors with one which it seems to us will for years to come be *the* standing work of superior excellence.

* * *

Sundry Acknowledgments.—The *Country Review* from Baton Rouge, La. Several numbers of this valuable paper have reached me, bringing me the many communications of our always working contributor, Dr. Dalrymple, and also the proof that he does not neglect his friends, if far away.

The *Catalogue* and *Bulletin* of the Michigan Agricultural College, with the organization and announcement of the Veterinary Department, with Dr. R. P. Lyman as Dean.

Circular 201 of the Bureau of Animal Industry, *Tuberculosis of Hogs,* by Dr. J. R. Mohler, Chief of the Pathological Division, and Henry J. Washburn, Senior Pathologist. The circular has few well made illustrations. A. L.

THE ARMY VETERINARY BILL IS ALIVE; IT IS ON THE CALENDAR OF THE HOUSE OF REPRESENTATIVES.

The sixty-second Congress is now sitting in its third and last session, which closes March 4. The whole profession is on the *qui vive* concerning the chances of passage for the Army Veterinary Bill (H. R. 16843) to Consolidate the Veterinary Service U. S. Army and Increase Its Efficiency. Never was there such a sense of solidarity on the part of the American veterinary profession in favor of a bill as during the session of Congress which closed in August; never before was the profession carried to such a pitch of united interest in army veterinary legislation, strengthening each day as long as Congress remained in session, as was to be observed amongst us all last summer. The measure was not carried before Congress closed. Nevertheless it is not dead. It is alive. It is on the calendar of the House of Representatives and it is highly probable that it will come up for a vote by the lower house soon.

Lest the members of the profession have not clearly in mind all the conditions which prevented our securing the passage of the Army Veterinary Bill in the closing days of Congress, familiarity with the facts may be gained in a few words.

A week prior to the adjournment, Dr. W. Horace Hoskins writes, every vestige of opposition to our bill in the House had passed away, and in addition to this gratifying situation, such support had been pledged us in the last ten days in the Senate that had we not have failed in the House our bill would surely have passed the Senate, more than fifty of whose members had pledged their support to its passage. Two very great obstacles arose which prevented the accomplishment of our wishes and plans. First, the Senate Military Subcommittee, under the leadership

of Senator Bristow of Kansas, refused to report favorably our bill and therefore the Senate Military Committee as a whole, a majority of whom were committed to our favor, were unable to act on the matter, because the subcommittee had to act before the whole Senate Military Committee could act. As there was some opposition to the bill in the House in the early spring, our professional representatives did not deem it safe to have the bill put on the "unanimous consent calendar," for the reason that the opposition to the bill by any one member would have caused the necessity of reintroducing the bill if it were lost in that way. The bill was therefore kept on the "suspension of the rules calendar," which was to be considered during the last five days of Congress. The very serious contentions that arose during the closing days of Congress and the absence of a large number of members incident to the Presidential contest and because of their own nervousness over re-election, brought it about that when the "suspension of the rules calendar" was being considered, Representative Victor Murdock of Kansas raised the question of no quorum. The House was unable to secure the necessary number of members; hence no further business could be transacted and adjournment followed, leaving our Army Veterinary Bill along with other bills on the calendar for consideration during the winter session of Congress.

The Army Veterinary Bill, as every man knows, is pushed by the profession because it grants the rank of second and first lieutenant to all veterinarians in the U. S. Army and relieves the profession of inequality with all other professions in the Army. This bill has passed its first reading—for it was favorably reported out of the House Military Committee April, 1912—and it should be favorably acted upon on the floor of the House and in the Senate. The time, however, is very short, for on account of the Christmas holidays, Sundays and other holidays, Congress has only about sixty working days in all. Still everything favors the bill, and the halt which the bill suffered at the close of the last session but serves to put a fine edge on our courage. The military establishment loves fighters; it respects our steadfastness and integrity of purpose; it is waiting to say bravo, if we

win. The hand of destiny is with us. Let us firmly resolve that the bill shall pass and pass it will. For events outside the profession favoring the bill are in keeping with the wholesome and altogether heightening influences within the profession which are pushing the bill along like a hurricane. The president of the A. V. M. A., Dr. John R. Mohler, is keen for the bill and he lives in Washington. The A. V. M. A. Legislative Committee has commenced its activities in the capital. The whole profession will soon be called upon to rally for the bill and it will leap to the call. Victory after fifty years fight for recognition as a profession in the Army can then be celebrated at the fiftieth national veterinary convention in New York next September. A man of fifty is at his full strength; surely a profession fifty years old ought to be able to win this long drawn out battle.

[Addendum.]—The receipt of a communication from Chairman Hoskins of the Committee on Legislation, A. V. M. A., at the last moment renders a slight addition to the foregoing necessary; as, after a conference in Washington on December 16, the committee found it advisable to have the Bill transferred from the "Suspension of Rules" calendar to the "Unanimous Consent" calendar, as explained in the following extract from Chairman Hoskins' letter:

"For many months we have been on the Suspension of Rules calendar No. 3. As all Unanimous Consent bills have precedence over Suspension of Rules Calendar bills, and on every day set apart for consideration of bills under these two rules of the House we have failed to be reached (in fact, the Suspension of Rules Calendar has not been reached for several months) after a conference in Washington on Monday, December 16, when we again failed to be reached, we decided to have our bill transferred to the Unanimous Consent calendar, and early after January 2, 1913, when Congress reconvenes, we will run the gauntlet of this calendar. You will remember that one vote of opposition will set us back, and make necessary much of our work to be done over, but we are determined to win this bill this session of Congress, if possible.

"The situation in the Senate grows more favorable day by day, but on January 1, 1913, we will lose in Senator Bailey, by his resignation from that body, one of our staunch friends. This makes it all the more important that we win in this Congress, if possible."

ORIGINAL ARTICLES.

THE LIMITATIONS OF THE TUBERCULIN TEST.

By E. G. Hastings, College of Agriculture, University of Wisconsin, Member of the Wisconsin Live Stock Sanitary Board.

During the twenty years that the tuberculin test has been in practical use, its value has been demonstrated beyond all doubt. Without it as a means of detecting the diseased herd and the tubercular animals therein, the fight of the practitioner, the sanitarian, and the stock owner against bovine tuberculosis would be a hopeless one. Its value has been shown in the elimination, by its aid, of tuberculosis from countless herds, and in the gradual reduction of the amount of the disease in many sections of our own country and in other lands; something that could not have been easily accomplished without the tuberculin test. This has been done in spite of the fact that the spread of tuberculosis has been favored by the constantly increasing commerce in dairy cattle, and through the whole-milk creameries, whose by-products, skim milk and buttermilk, have often served to transport the disease to new fields.

In spite of the proven value of the test, constant mutterings are heard against it, uttered by the stockman, the veterinarian, and the agricultural press. Stockmen often deny the value of the test because they do not wish to acknowledge the existence of the disease, at least in their herds. Again, they have heard something adverse to the test, and hence decline to use it, even though they desire to learn the condition of their animals.

It probably seems to the farmer that all should be known concerning the test that need be known so far as its practical use is concerned. Millions of cattle have been tested, so experience has not been lacking. It seems to the writer that here, as often elsewhere, the persons applying the test have not stopped to con-

sider its nature, and, again, certain points in the mode of action of tuberculin have been pointed out only comparatively recently.

From a somewhat extended experience with the tuberculin test as an instructor and member of an experiment station staff and as a member of a state live stock sanitary board, it seems to the writer that the practitioners and stockmen have been led astray in regard to the test. The stockman has been led to believe that it was a means of detecting the presence of any and all tubercular animals, a belief which has been shared by the profession in great part. They have read statements that the test is a wonderfully accurate diagnostic agent, as it is, and the point has been emphasized by figures showing the results of post-mortem examinations made on reacting animals. The government has said that 98 per cent. of the animals that have reacted to the tuberculin prepared by the Department of Agriculture and that have been examined after slaughter have shown lesions of tuberculosis. The state authorities of Pennsylvania have stated that only 8 out of 4,000 reacting animals slaughtered in that state failed to show lesions on slaughter. The writer does not question the accuracy of these or other similar statements, although, when the only discoverable lesions are stated to be calcareous deposits in the intestines, one might be justified in having a little doubt about the correctness of the diagnosis in all cases.

The harm of such statements as to the accuracy of the test is that the converse is believed to be true by the average reader; *i. e.*, that all cattle in whose bodies tubercle organisms are to be found react to the test. If this is true, then the testing of a herd by an able practitioner, the removal of the reacting animals, and the thorough disinfection of the stables should result in a healthy herd; or at least a retest followed by the removal of the reacting animals and disinfection should give a healthy herd. Many practitioners in attempting to eliminate the disease from a herd extensively infected have had experiences that have not agreed with this theoretical result. The disease has been found to persist after years of conscientious effort on the part of the veterinarian and the owner. The latter, if not in full sympathy with the

test, has been led by his experience to denounce it as a fake. If his faith in the test was more firm, he has been led to seek the cause in inefficient testing or poor tuberculin, both possible factors. The veterinarian with his faith in the accuracy of the test has been led to seek the cause of persistence in faulty disinfection, again a possible factor. Both seek to lay the blame at the other's door. The result has often been that the owner has abandoned the task of obtaining a healthy herd from a diseased one by the use of the tuberculin test. A concrete example of this was given in the *Breeders' Gazette* within the last few months in an article detailing the experience of a man in charge of a herd belonging to one of the state institutions of Illinois. The discouragement and abandonment of the task is to be traced to the fact that he had been led to expect results that in the light of present knowledge he could not reasonably have hoped to attain. If his expectations had been more in accord with probable results, he would not have became discouraged.

In order to demonstrate the belief of one veterinarian at least that testing and removal of reactors should result in a healthy herd, the statement made by Dr. G. S. Baker, quoted in the Proceedings of the American Association of Medical Milk Commissions, 1911, is here given: "When the work (the elimination of tuberculosis from herds producing certified milk) was started in California, it was supposed that all that was necessary to do was to test the original herd, exclude the reactors, and disinfect thoroughly."

A Wisconsin herd has been diseased for at least ten years. Repeated tests have been made, the reactors removed, and yet the disease persisted. An expert's aid was enlisted. This expert adviser has made a public statement that he believed the persistence of this disease was due to faulty disinfection, from which it may be inferred that he did not believe that the test itself could be a factor concerned.

It has been related to the writer that some practitioners will guarantee the results of their tests, a witness to their belief in the accuracy of the test. Such statements and such belief can explain

the introduction of the following bill in the legislature of Wisconsin in the session of 1911.

" No permit shall be granted to any person to apply the tuberculin test to any cattle, other than his own, until such person shall have given a bond to the state of Wisconsin in the *penal sum of two thousand dollars,* conditioned that he will pay to the owner of any stock so tested by him and determined and found by him to be affected with tuberculosis and condemned to be slaughtered under the United States supervision on account of such determination the *actual value* of the said stock in excess of the amount allowed to him as now provided by law, and, in addition thereto, damages to the *extent of twenty-five per cent. of the actual value of said stock,* in case it shall be found upon the said government test that the said stock was not so affected by tuberculosis."

It is very certain that had this bill been enacted into law no veterinarian with any detailed knowledge of the tuberculin test would have continued to apply it. These statements are included to emphasize the point that in the minds of many men, laymen and veterinarians, the tuberculin test has been considered to have few, if any, limitations.

If an animal is killed after having given a reaction to tuberculin, and on post-mortem examination no lesions or only minute ones are found, many are only too glad to find therein ground for the condemnation of the test. A number of cases have been brought to the writer's attention where tubercular animals have been discovered to be present in the herd shortly after a test had been made and the reactors removed.

In a recent article in this journal Dr. S. H. Gilliland has presented the results on the elimination of tuberculosis from a herd by means of the Bang method and vaccination. The results of the consecutive tests are presented in Table I. It will be noted that two and one-half years were required to remove all tubercular animals from this herd, and this under quite ideal conditions in most ways. The manner in which the disease was reintroduced will be referred to later.

TABLE I. RESULTS OF CONSECUTIVE TESTS OF A HERD FROM WHICH THE REACTING ANIMALS WERE REMOVED AFTER EACH TEST.

Date.	Animals Tested.	Animals Reacting.	Per Cent. of Reactors.
May, 1904	160	42	26.2
June, 1905	120	13	10.8
November, 1905	137	7	5.1
April, 1906	154	13	8.4
November, 1906	137	5	3.6
April, 1907	201	0	0.0
October, 1907	131	0	0.0
April, 1908	145	2	1.4
November, 1908	169	3	1.8
April, 1909	151	0	0.0
May, 1910	151	5	3.3
June, 1911	160	4	2.5

That the tuberculin test has certain limitations, it seems to the writer, has never been sufficiently appreciated by the veterinarians or stock owners. This lack of appreciation is largely due to the fact that the subject has never been presented to them in a proper way. With an appreciation of the limitations of the test a veterinarian would no more guarantee the correctness of his test as showing the absence or presence of tuberculosis than would a surgeon the results of an operation for appendicitis.

Tuberculin is the product of a specific organism, the tubercle bacillus. The organism is allowed to produce the maximum amount of growth in glycerine bouillon, which is then heated together with the growth for a number of hours to the boiling point of water. The subsequent operations in the preparation of tuberculin are designed to free it from the dead organisms and to reduce it to a form in which it will keep well. Tuberculin thus contains the by-products of the growth of the organism and such materials as can be extracted from the cells by a hot aqueous solution of glycerine. Some principle or principles contained therein when introduced beneath the skin of a tuberculiar animal cause a disturbance of the bodily functions. This disturbance includes a greater or less thermal reaction, and since this can be easily measured it is the thing used to determine whether an animal is diseased or not.

The technique of the test is known to every practitioner. It

includes a series of ante-injection temperatures, the injection of the tuberculin, and a series of post-injection temperatures. In the case of a tubercular animal, the reaction fever usually appears within eight to sixteen hours, it persists for a few hours,

TABLE II. TYPICAL REACTIONS IN TUBERCULIN TESTS.

	Before Injection P. M.			
	2	4	6	8
1	1.4	2.0	1.5	1.6
2	1.0	1.8	1.6	1.5

	After Injection Hours.															
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	2.2	2.0	2.6	3.8	4.8	5.2	4.2	3.8	2.8	3.0	2.6	2.2	2.4	1.8	2.2	1.8
2	2.0	2.0	2.8	3.5	4.7	5.4	5.6	3.9	3.2	3.5	3.0	2.2	2.0	1.8	1.5	1.5

and within fourteen to twenty hours the temperature usually reaches normal. In Table II. are presented the temperature records of animals giving a perfectly typical positive reaction.

TABLE III. VARIATIONS IN THE TEMPERATURES OF HEALTHY ANIMALS.

Hour.	Temperature of Animal. No. I. Degrees F.	Temperature of Animal. No. II. Degrees F.
9 a. m.	99.1	98.6
10 a. m.	99.0	99.0
11 a. m.	100.0	98.8
12 m.	100.0	100.0
1 p. m.	100.6	100.9
2 p. m.	100.8	101.2
3 p. m.	101.6	101.8
4 p. m.	102.0	102.3
5 p. m.	101.8	101.7
6 p. m.	101.5	101.7
7 p. m.	101.2	101.4
8 p. m.	101.2	101.2
9 p. m.	101.0	101.4
10 p. m.	100.9	101.2
11 p. m.	101.3	101.6
12 midnight	101.0	101.0
1 a. m.	100.8	100.8
2 a. m.	101.0	101.2
3 a. m.	100.8	101.5
4 a. m.	100.8	101.4
5 a. m.	101.4	101.2
6 a. m.	101.4	101.8
7 a. m.	101.4	101.9
8 a. m.	101.6	101.8

For the sake of brevity, the temperatures have been abbreviated, 102.2° F. is written 2.2, etc.

In the case of a healthy animal, the temperature readings after the injection should be much the same as before, since no disturbance is produced by the tuberculin. The test is thus apparently a most simple one; but there are many disturbing factors. The great fluctuations of the temperature of the individual animals is one. In Table III. are given the temperature of two animals for twenty-four hours. It is to be noted that the range of temperature is over 3° F. in each animal.

In order to determine whether the tuberculin has produced a thermal reaction, it is necessary to compare the ante-injection temperatures with the post-injection. The question at once arises as to what degree of variation shall be taken to indicate a reaction fever and the presence of tuberculosis. Many methods of interpreting the records have been proposed and are in use. The maximum before may be compared with the maximum after injection, a rise of from 1 to 1.5° F. or more being looked upon as indicating a positive reaction. Again, the maximum after injection may be compared with the average before, a difference of 2° F. or more indicating tuberculosis, or the greater reliance may be placed on the temperature reaching a specified minimum, at least of 104° F., after injection, with normal temperatures before. This variance in ideas indicates that there is no line above which an animal can be said to have reacted or below which it can be classed as healthy. The inevitable conclusion is that the interpreter of temperature records is between the devil and the deep sea. With any method he will remove healthy cows with all or most of the tubercular or else he will leave all the healthy cows in the herd together with some tubercular, and remove only a part of the tubercular; the former will be the result of too low a standard, the latter of too high a standard. In Table IV. are presented the maximum temperatures before injection and the maximum after injection, together with the extent of the reaction and the results of the post-mortem examination of a number of animals. The figures are taken from the results of the tests of a

TABLE IV. MAXIMUM TEMPERATURES BEFORE AND AFTER THE INJECTION OF TUBERCULIN OF TUBERCULAR AND HEALTHY ANIMALS.

Animal.	Before Injection.	After Injection.	Degree of Reaction.	Result of Post-Mortem.
1	102.2	102.6	0.4	Healthy
2	101.8	102.8	1.0	Healthy
3	102.6	104.2	1.6	Healthy
4	102.2	103.4	1.2	Healthy
5	101.6	104.0	2.4	Healthy
6	102.6	103.8	1.2	Healthy
7	102.3	104.6	2.3	Tubercular
8	102.4	104.8	2.4	Tubercular
9	102.5	103.0	0.5	Tubercular
10	102.0	104.2	2.2	Tubercular
11	103.6	103.8	0.2	Tubercular
12	102.0	103.6	1.6	Tubercular
13	102.0	104.0	2.0	Tubercular
14	102.4	102.8	0.4	Tubercular

large herd which was so extensively diseased that it was all sacrificed.

It will be noted that the temperature records of the tubercular animals can be duplicated in case of those showing no lesions of tuberculosis on post-mortem examination, which was most carefully made.

In a personal letter from a prominent veterinarian who is acting as expert adviser for the owner of a large herd, it is stated that in the handling of the herd all animals showing post-injection temperatures of 102.8° F. and above have been removed. Of the animals showing a maximum temperature between 102.8 and 103.5° F. 40 per cent. have shown lesions of tuberculosis on slaughter. If the minimum standard had been 104° F., tuberculosis in the herd would surely have persisted longer than under the plan adopted.

TABLE V. RESULTS OF POST-MORTEM EXAMINATION OF 1,200 ANIMALS THAT GAVE VARYING THERMAL REACTIONS AFTER THE INJECTION OF TUBERCULIN.

Maximum Temperature After Injection.	Percentage of Animals Found Tubercular.
105.8 degrees F. and above	98
104-105.8 degrees	84
103-104 degrees	62
103 degrees or less	56

In Table V. are presented the results of the post-mortem examination of 1,200 animals tested in Holland. The animals were slaughtered for beef soon after the test.

It is to be noted from the table that as the temperatures approach or are within the limits of those given by animals to which tuberculin has not been administered, the percentage of error increases greatly.

The inevitable conclusion from the data presented is that there is no *specific amount of thermal reaction* to tuberculin in the case of *tubercular* animals; that no method of interpreting the temperatures can have the effect of absolute separation of the herd into two parts, healthy and diseased. It is true that by far the greater part of the tubercular animals give such a thermal reaction that there is no doubt as to its significance.

In the typical reaction to tuberculin the fever appears eight to twelve hours after the injection of the tuberculin. This has led many practitioners to deviate from what is considered the most approved technique, namely, to take temperatures every two hours from the eighth to the twentieth hour after injection. Many cease taking temperatures at the sixteenth hour. The danger of such a procedure is shown by data taken again from Dr. Gilliland's paper.

Table VI. Temperature Records of Two Cows.

	Proceda. Degrees F.	Francelmar. Degrees F.
5 a. m.	101.4	101.4
7 a. m.	102.0	102.0
9 a. m.	101.6	101.8
11 a. m.	101.6	101.6
1 p. m.	100.6	102.0
3 p. m.	101.0	101.6
5 p. m.	101.6	102.4
Injection of Tuberculin.		
9 hours after	101.4	100.6
11 hours after	102.2	101.4
13 hours after	102.2	100.8
15 hours after	102.4	101.6
17 hours after	104.6	102.2
19 hours after	106.6	104.0
21 hours after	105.0	105.0
23 hours after	105.4	106.0

It will be noted from the temperature records that if the test had been closed at the sixteenth hour one, and probably both, cows would have been considered healthy. Thousands of tests have been made by practitioners in this country in which but three, two, or even one, post-injection temperature was taken.

The typical reaction fever lasts but a few hours. Records such as are shown in Table VII. are sometimes met. The ques-

TABLE VII. PERSISTENT REACTIONS IN TUBERCULIN TESTS.

	Before Injection P. M.			
	2	4	6	8
1	1.2	2.8	3.0	2.6
2	1.9	2.3	2.4	1.8

	After Injection Hours.															
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	6.5	7.2	7.5	5.6	6.0	6.0	6.0	5.4	5.8	5.4	6.0	5.0	5.4	5.5	5.6	5.4
2	4.9	4.9	6.4	5.8	6.4	7.1	6.6	6.2	5.8	6.3	6.2	5.8	6.8	6.5	6.2	5.8

tion at once arises is not the fever in these cases due to some other cause than tuberculin? Again, a secondary reaction, such as is shown in Table VIII., may be met, a very decided departure from

TABLE VIII. SECONDARY REACTIONS IN TUBERCULIN TESTS.

	Before Injection P. M.			
	2	4	6	8
1	1.2	1.8	1.6	1.6
2	1.6	2.8	2.4	2.2

	After Injection Hours.																
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.8	3.2	4.4	5.2	5.4	4.8	3.8	3.2	4.2	5.2	5.6	5.8	5.8	5.6	5.2	5.2	4.9
2	4.4	4.2	4.6	5.8	5.4	5.4	4.8	4.2	3.5	4.9	5.8	6.2	6.0	5.4	5.6	5.2	5.4

the typical reaction to tuberculin. Someone must determine whether such records are to be classed as indicating a positive reaction to the tuberculin. The stockmen and practitioners are very likely to consider that some other cause for the continued fever must be present and that the animal should simply be looked upon with suspicion and be retested. The animals, the temperature records of which are given in Tables VII. and VIII., were slaughtered and found to be tubercular. Hence there is but

little doubt but that these were true but atypical reactions. Such records are constantly met with in practical work.

TABLE IX. RESULTS OF CONSECUTIVE TESTS OF REACTING ANIMALS.

Animal.	May, 1905.	Oct., 1905.	Sept., 1906.	May, 1907.	Oct., 1907.	Sept., 1908.	Results of Post Mortem Oct., 1908.
1.....	+	+	+	+	—	—	Tubercular
2.....	+	+	—	—	—	—	Tubercular
3.....	+	+	—	—	—	—	Tubercular
4.....	+	+	+	—	—	—	Tubercular
5.....	+	+	—	—	—	—	Healthy
6.....	+	+	—	—	—	+	Tubercular
7.....	+	+	+	—	—	+	Tubercular

It must also be recognized that not all infected animals react to tuberculin. During the period of incubation, which may be at least two months in duration, the animal does not respond to the test. After infection, the struggle between host and parasite begins, a struggle in which first one, then the other is gaining. The disease may continue to progress until death ensues, or it may progress for a short time and then go backward, even to complete recovery. More often in the bovine the disease becomes dormant, the lesions become encapsulated, but within the lesions the tubercle organisms remain alive for months and years. During a period of diminished vitality, the disease may become progressive again. While the disease is dormant in the animals, it is believed that no response to tuberculin is to be noted. Such animals are now classed as " ceased reactors." The period of persistence of this phase of tuberculosis and the non-reaction to tuberculin during this time is well shown in cases gleaned from a recent article by Dr. Rutherford. It will be noted that a number of the animals gave the last positive reaction in October, 1905, and yet were found tubercular on slaughter in October, 1908. Still others have ceased to react and have then again given positive reactions. Since these animals were kept in a diseased herd, it might be considered that they had become reinfected. If such a reinfection is possible after a natural infection, it would seem that vaccination does not promise much in the way of practical success.

In Table X. are presented data taken from an article by Dr.

V. A. Moore. The ninety-six animals had been purchased from a locality in which tuberculosis was especially prevalent. At the time of purchase none reacted to the test. After purchase the

TABLE X. RESULTS OF CONSECUTIVE TESTS MADE ON ANIMALS THAT DID NOT REACT AT TIME OF REMOVAL FROM A DISEASED HERD.

Date of Test.	Animals Tested.	Reacted.
July, 1904	96	31
January, 1905	65	8
July, 1905	57	15
January, 1906	42	15
July, 1906	27	3
January, 1907	24	2
July, 1907	22	1
January, 1908	21	1
August, 1908	20	1

animals were kept under such conditions that infection, except from their own number, was impossible. The presence of animals in the incubation period, or having the disease in a dormant form at the time of purchase, would explain the persistence of the disease. The development of open cases between the semi-annual tests would explain the continued spread of the disease, so that at the end of four years but nineteen healthy animals remain.

It has long been known that some animals in advanced stages of tuberculosis do not react to ordinary doses of tuberculin. It is not believed, however, that such cases are numerous enough so that they need be considered as an important factor in the practical handling of the disease.

These difficulties which are encountered in the separation of healthy from tubercular animals, especially in the case of herds extensively diseased, by means of the tuberculin test has led the live stock sanitarian to assert that in the fight against tuberculosis the healthy *herd* must be considered as the unit, not the healthy *individual*. The same points led the commission appointed by the American Veterinary Medical Association to report as one of its recommendations that herds over 50 per cent. of the members of which gave positive reactions be handled, as far as eradication

of the disease is concerned, as though all the herd had reacted. If the non-reacting part of such a herd is removed, among them are almost certain to be some infected animals that will serve to continue the disease in the non-reacting part of the herd after separation. As the per cent. of infected animals decreases the importance of this factor diminishes, until in the case of a herd containing but few reacting animals it becomes an easy matter to eliminate the disease, while in the case of a badly diseased herd, especially if it is a large one, it becomes a task demanding patience, faith, and usually years of effort.

The fact that the disease may become dormant and again progressive has led the sanitarian to consider an animal that has once reacted to the test as one that should never be placed in a healthy herd. The danger of relying on a retest rather than on the first test is shown in case of the two cows previously mentioned. The temperature records have been presented in Table VI.; those of the retest, made about three months after the original test, are given in Table XI.

TABLE XI. TEMPERATURE RECORDS OF PROCEDA AND FRANCELMAR ON RETEST, FEBRUARY, 1909.

	Proceda.	Francelmar.
5 a. m.	102.4	102.4
7 a. m.	102.0	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	101.0
5 p. m.	102.2	101.4
Injection of Tuberculin.		
9 hours after	102.6	100.6
11 hours after	102.4	101.4
13 hours after	100.6	101.0
15 hours after	101.2	102.0
17 hours after	103.0	102.2
19 hours after	101.2	101.4
21 hours after	103.0	101.6
23 hours after	102.6	.....

It will be noted that neither have given a positive reaction. Tests were made in April, 1909, and May, 1910, at which times the animals did not react. Late in the summer of 1910 both began to show symptoms of tuberculosis; they were slaughtered

and found to be extensively diseased. Their return to the herd is the undoubted reason for the second reinfection of the herd as shown in Table I.

In the greater majority of cases animals give an undoubted positive or negative answer when the tuberculin test is applied. In probably about 15 per cent. of the animals examined the test is in error. By far the greater numbers of errors are due to the non-reaction of tubercular animals. This 15 per cent. is what has led many to doubt the value of the test. This feeling can be overcome only by a full recognition of what can and what cannot be expected from the tuberculin test when it is used to eliminate tuberculosis from a diseased herd or to prevent its introduction into a healthy one. The stockman must decide for himself whether it is wise for him to make use of this test with those limitations which have been discussed herein. This decision will be influenced by what the stockman thinks is the economic importance of the disease, a subject on which no one has any adequate knowledge. It is the belief of the writer that tuberculosis causes losses far in excess of any estimates that have been made by the Bureau of Animal Industry. In private conversation with a man slaughtering cattle for local consumption (not in Wisconsin), who draws his supply largely from cows turned off by the dairymen of a market milk district, it was asserted that over one-third, and probably one-half, of the animals slaughtered were tubercular. The statements made, which could probably be duplicated by the majority of local butchers, emphasize the need of local meat inspection.

Such animals are turned off by the farmer because, in many cases, they are unthrifty. The farmer thinks the cause of the unthriftiness is an inevitable one, and hence does not consider it as a preventable loss. Contagious abortion causes losses to which the farmer is awake. Tuberculosis causes greater loss as far as the individual animal is concerned because it destroys in great part the beef value of the animal, while abortion does not. The loss suffered is the difference between what is received for the animal and her value as a milch cow in either case.

One could imagine the success that would attend the sale of a lot of horses if the would-be purchaser knew that 50 per cent. were likely to be afflicted with an unsoundness that could not be recognized on a physical examination, but which was likely to ruin the animal as a work horse. Yet the spectacle is constantly presented of the purchase of animals from herds extensively diseased by men who know, or should know, the danger in such a procedure, even though such animals do not react. There is no doubt but that by the intelligent use of the tuberculin test, with all of its limitations, any herd can be freed from tuberculosis and the disease be prevented from entering a healthy one.

The handling of a herd from the standpoint of tuberculosis is the problem of the owner, and laws can do little, education can do much more, but to be effective the information imparted to the farmer and breeder must be the truth and the whole truth as far as present knowledge goes, and not statements that are not upheld by experience, and which cannot be proven.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.—Through the courtesy of Secretary Reichel we are able to announce that this association will hold its thirtieth annual meeting in Harrisburg on January 21 and 22, 1913, contrary to the usual custom of holding the annual meeting in Philadelphia and in March. The meeting will be held during the week of the meetings of the Pennsylvania Livestock Breeders' Association and the Pennsylvania State Dairy Union.

Aside from a good program which is now shaping itself, good reports are expected from the following committees: Committee on Medicine and Surgery, J. W. Adams, chairman; Committee on Milk and Meat Hygiene, L. A. Klein, chairman; Committee on Legislation, W. H. Hoskins, chairman. Members of the profession in Pennsylvania and surrounding states are cordially invited. Details of the meeting are being attended to by the following local committee of arrangements: T. E. Munce, chairman; J. H. Oyler, R. M. Staley, E. L. Cornman and R. C. Gross.

EPIZOOTIC EQUINE ENCEPHALOMYELITIS (BORNA DISEASE).*

By C. H. Stange, Dean Division of Veterinary Medicine, Iowa State College.

During the month of August, 1912, there appeared among the horses of southwestern Kansas a disease presenting symptoms resembling forage or mould poisoning, *i. e.*, a severe affection of the central nervous system. From the point of origin the disease spread in an easterly and northeasterly direction to the major portion of Kansas, across Nebraska and into South Dakota on the north, and into Iowa and Missouri on the east. It required only about two months' time for the disease to spread to this extent and destroy about 30,000 or between four and five million dollars' worth of horses, it being fatal in over 90 per cent. of the cases.

Aside from the economic importance of devising some method whereby this disease may be controlled, it is of great scientific interest to determine the clinical symptoms, the pathological changes and, if possible, the etiology of this so-called Kansas horse disease, in order to determine its relationship to Borna disease, or epizootic equine encephalomyelitis, which is quite common in Europe, being known since 1813. Liautard is recorded as having observed sporadic and enzootic outbreaks in North America in 1869. In 1894 the disease acquired a wide distribution and a very virulent character especially in and about Borna (therefore the name Borna disease), in the eastern part of the province of Halle, Germany.

A considerable number of outbreaks of mould poisoning have

* Read before the twenty-fifth annual meeting of the Iowa Veterinary Association, at Ames, November 12, 1912.

Note—The above figures relative to the number and valuation of horses destroyed have been estimated as nearly as possible.

been investigated by the writer in the past five years, and while there is great similarity between the clinical symptoms of mould poisoning and the recent outbreak, there are, nevertheless, some very important differences in reference to the appearance and spread of the disease.

In all outbreaks of forage poisoning with which I have had experience and which literature records, we have practically all animals affected that partook of a certain mouldy food or of water from one source. This food or water in my experience has always been visibly affected by some fungus. This is notably true of silage, and feeding experiments with horses have substantiated our theory as correct. For more detailed information concerning a part of our work I refer you to my report as chairman of the Committee on Disease and Treatment, made before this Association four years ago, a part of which is as follows: "It remains to be shown whether all cases of cerebro-spinal meningitis are due to the same cause and resemble Borna disease." "It is apparent that mouldy food and water has caused several outbreaks in this country." Since making that report other outbreaks have been investigated, and there is no longer a question but that mouldy food may and does cause poisoning accompanied by severe nervous symptoms and is highly fatal."

An important feature of these outbreaks is that they were restricted to localities where certain conditions or fungi existed, and that practically all horses fed on the affected food were afflicted. This is in marked contrast to our recent outbreak, which sometimes affected one of a dozen animals kept under similar conditions and on the same food. In other cases it affected practically all the animals, including those at pasture as well as those that received no green food outside of possibly corn fodder or in some cases alfalfa hay of this season's cutting; also the disease was not restricted to any particular locality in which certain climatic or other conditions existed; neither did it follow any stream or streams of water, but spread across two states into three others in a direction opposite to which it would be expected to follow if the season, *i. e.*, climatic or vegetative

conditions were responsible for the cause (in this instance it should have spread in a southerly direction).

Borna disease usually begins with disturbed appetite, depression and drowsiness. Very soon other symptoms appear and in about the following order.

In reference to the digestive tract, most of the cases show increased or decreased appetite, eructation, difficulty in swallowing, icterus of the mucous membranes, disturbed defecation and abnormal consistency of the feces, sometimes accompanied by colicky symptoms.

In the nervous system we notice varying drowsiness, at times excitement, occasionally increased sensibility, more frequently, however, decreased sensation and attacks of dizziness. In addition there may be various nervous disturbances in some cases, shown by epileptiform attacks, madness, uneasiness, tendency to stumble or lie down.

Abnormal movements may be seen in practically all cases, usually incoordination, and very frequently animals move in a circle. A groping gait is sometimes seen. About one-half of the cases suffer a disturbance of the sense of localization and attention, and consequently are prone to collide frequently with objects. Quite often as a result of touching or during an attempt to lead the animals they go backwards, of their own accord, until stopped by some solid object.

There is a marked predisposition toward the existence of muscular spasms. They may appear in all grades, from fibrillar contractions to convulsions. The most frequent are the mild contractions, causing gnashing of the teeth. Very frequently there is a curvature of the neck toward the side. Moreover, the contraction of single muscles produces the most variable symptoms. For example, elevation of the lips or commissure of the mouth, trismus, dilatation of the nostrils. Prostrate animals may show swimming or paddling motions of the extremities.

Paresis and paralysis may affect certain regions singly or be combined, producing functional disturbances, and are found in practically every case. The dysphagia may be due to infiltration,

paresis or paralysis of the pharynx. The frequent disturbance in the nerves supplying the tongue, lips and muscles of mastication and deglutition, interfere with the nutrition and consequently cause emaciation. Paralysis of the muscles of the back and hind quarters, also the extensors of the limbs, cause stumbling and inability to rise, which hastens death.

The eye is frequently affected; icteric discoloration of the conjunctiva, or congestion, or a combination of the two, is seen in most cases. Pale or livid color or swelling is seldom seen. Keratitis is occasionally seen following traumatism. A fixed gaze, rolling, or oscillation of the eye-balls, are symptoms that may be seen in patients with affected eyes. Decreased pupillary reflex and unequal dilatation of the pupil is occasionally observed. In about 5 per cent. of the cases there is blindnes due to amaurosis.

The circulatory apparatus is also frequently affected, indicated by increased frequency of the pulse, which in other cases may be sub-normal. The pulse in a very few cases may be weaker than normal.

During the course of the disease the respirations show various changes. Most frequently respirations are increased, but may be decreased. In a very small percentage of the cases, difficult, noisy respiration is seen. Respirations may be purely abdominal or wholly costal in type. About one-half of the cases show slight rise in temperature, which rarely goes above 103 degrees. The nutrition does not always suffer as a result of the disease, and great emaciation is seen in about 25 per cent. of the cases. Examination of the urine is negative, with the exception of those changes common to constipation, fever and retention of the urine.

Examination of the blood reveals a normal erythrocyte count and a slight leucocytosis.

According to Schmidt's experience 6.3 per cent. made a complete, 3.6 per cent. a partial recovery, but most of the cases die in from one to two weeks.

Considering the nervous disturbance according to the centers affected, we have the following conclusions: Depression, which

is one of the first symptoms, sometimes displaced by excitement, must be due to an affection of the cortex of the cerebrum, as this is the seat of consciousness. In most cases it is probably affected in localized areas. In diffuse affections, consciousness is permanently destroyed. The close connection between the cerebrum and the pia mater almost precludes involvement of the latter.

The abnormal sensation, which may be increased or decreased, is partially due to disturbed consciousness; however, in some cases it is purely reflex, in which case it indicates usually a pathological involvement of the spinal cord.

Dizziness is seen in destructive processes of the pons or the cerebellum, also in affections of the labyrinth of the ear, and finally in severe disturbances of consciousness.

Epileptiform attacks outside of those produced reflexly are usually due to irritation of the motor centers. Muscular spasms may be produced reflexly from the spinal cord, but probably originate in the medulla which contains the spasm center. Irresistible movements are due to irritation or diseased process in the sub-cortical layers. The walking or paddling movements performed while the animal is down are of cerebellar origin.

The ataxia which consists of faulty movements is a result of certain groups of muscles being no longer coordinated. They may be due to spinal, bulbular, cerebellar or cerebral involvement.

Paralysis is usually due to a localized affection, and the larger this area or the nearer it is to a point where the motor fibers come together, the more muscles are paralyzed.

The above detailed symptoms point definitely to the presence of diseased centers in the substance of the cerebrum, cerebellum medulla oblongata and the spinal cord, as well as in the cerebral cortex, while the meningitis which is usually localized is only of secondary importance. The question now arises whether or not the other symptoms harmonize with this affection of the central nervous system. The temperature may be influenced by an affection of the brain or medulla, by the spasms, or toxins acting on the heat centers. The pulse, which usually varies with the body temperature, may also be affected by disturbance of the vagus center and intra-cranial pressure.

Especially difficult to explain are the digestive disturbances. They were formerly supposed to represent the primary symptoms. This, however, is a mistake, as they are very closely associated with the nervous affection. The disturbed appetite is a result of altered consciousness; furthermore by the involvement of the muscles of mastication, lips and deglutition. The latter also causes the disagreeable odor from the mouth and the coated tongue. The other changes are due to disturbances of peristalsis, secretion and circulation of the gastro-intestinal tract. These motor functions are very easily influenced by the vagus, which may destroy digestion entirely, when the medullary center is involved.

The icterus may be of catarrhal origin, resulting from obstruction or on the other hand follow hemolysis.

Borna disease, therefore, must be regarded as a disease of the cerebrum, cerebellum, medulla and probably also the spinal cord. The cerebrum seems to be most severely affected, while the meninges may escape entirely or show simply localized areas.

Pathologically, Borna disease is an acute, disseminated, infiltrative, non-suppurative meningo-encephalitis and myelitis of lympho-cyctic type and principally of a mesodermal (vascular) character (Joest and Dengen).

Histological examination of the pia mater shows a slight meningitis of mononuclear type, insignificant, however, as compared with the changes in central nervous system.

The vessels of the nervous tissue of the brain (and to a certain extent spinal cord) show a pronounced inflammatory infiltration of the adventitia and to a certain extent the peri-vascular lymph space. The cellular infiltration consists chiefly of lymphocytes, in addition some polyblasts and various other cells, but very few or no polymorpho-nuclear leucocytes. In addition to this perivascular infiltration we also found areas of degeneration varying in size, but the largest scarcely visible to the naked eye. These areas appeared as unstained fields, and where the process was most advanced, the tissue structure could not be recognized. In other sections the process was in the initial stage and could

only be recognized by a failure to stain properly. Therefore, when the actual condition is considered, the disease should be called epizootic equine encephalomyelitis.

A clinical diagnosis is not always easily made, because the clinical picture is not always well defined, especially during the first few days. The symptoms of special importance are those of a nervous character, which indicate, in addition to an affection of the brain, involvement of the cervical and spinal cord. These are muscular spasms, including fibrillar contractions, spasms of the neck, difficulty in swallowing, yawning, gnashing of the teeth and trismus. Also hyperesthesia and ataxia. On the other hand, disturbances of consciousness, staggering, swaying of the hind quarters and involuntary movements may be seen in ordinary meningitis. Furthermore digestive disturbances and icterus must be included in a typical picture. The condition of the temperature, respiration and pulse is not significant in the diagnosis. The epizootic character of the disease is, however, significant In those cases that do not show the usual symptoms, it very readily becomes atypical, and a diagnosis may become difficult.

According to Schmidt, there can be no doubt but that the disease is infectious, but is not transmitted from animal to animal. In regard to the etiology I venture to say that the relation of the cocci and the diplococci that have been described in this connection has not been sufficiently well established to be accepted as true factors. Culture media, carefully inoculated with material from subarachnoid fluid, brain tissue, lateral ventricles, mucous membrane of ethmoidal cells and heart blood, remained sterile, with the exception of one tube inoculated from the lateral ventricle of a brain, which, however, is not significant on account of the fact that the brain was carried from Nebraska to Ames before the inoculation was made. Neither did microscopic examinations of the fluids, from which cultures were attempted, reveal variations from the normal. According to the investigations of Joest and Dengen, there are intracellular bodies frequently found in the ganglion cells, which may be of animal origin. The theory of Ostertag and others that the infectious agent may be found in

the water and in the ground, and may be carried to the animals with the food stuffs, seems plausible. The idea, however, that the catarrhal condition of the digestive tract affords the port of entry for the causative factor needs to be demonstrated, because, although the affections of the gastro-intestinal tract are early symptoms, nervous symptoms appear simultaneously, or in a very short time. It is reasonable to suppose that if the catarrhal condition of the digestive tract predisposed to the infection that there would be a period of time elapsing between this and the nervous symptoms. In other words, a period of incubation. In all probability, the affection of the digestive tract is but a part of the symptoms complex of the disease in its development. According to investigation of Joest, the olfactory nerve may act as a port of entry for the infectious material.

We must remember the possibility that the earth may be a potent factor in distributing the infectious agent, as it may be taken up by the wind in the form of dust, and in this way taken into the nasal cavities by the horses. This, it seems to me, might explain also why horses in the rural districts are most frequently affected, while, if the food acted in the capacity of carrying the infection, outbreaks in the city would be more frequent. In Schmidt's experience over 80 per cent. of the horses affected came from the rural districts. Also most of the cases were seen in the months from March to September. He suggests that the cold weather reduces the pathogenic properties of the infectious material. So long as the actual cause is not known, the agency of the dust and the wind must be considered, inasmuch as the recent outbreaks spread from southwestern Kansas in a northerly and northeasterly direction with our prevailing winds over the states of Kansas, Nebraska and into South Dakota and Iowa.

The age seems to have but very little influence. The same is true of the sex. The only predisposing factor seems to be that horses are kept in rural districts.

The most important factors to be considered in the treatment of this disease are hygienic and dietetic in nature. Of 415 typical cases treated by Schmidt, the greatest percentage of

recoveries was obtained by observing dietetic indications, with cold applications to the head, massages, bleeding and purging, but he states that this line of treatment was very frequently applied with no apparent beneficial results. He also, in addition to 35 different lines of treatment with drugs considered specific for nervous affections, tried the serum of horses that had recovered. This he did, admitting the fact that a natural immunity is not developed as a result of an attack and did not receive apparent relief in a single case. It is, so far as we know at the present time, possible to ascribe curative properties to no drug. Considering the pathological changes, it is difficult to imagine a drug that could possess these properties.

Prophylaxis is very difficult, so long as the cause and mode of infection are not known; even granting that the inhalation theory is correct, it would be very difficult or impossible to devise a method by which horses in our rural districts could be protected. Even the withdrawal of all kinds of green food and newly made hay is practically impossible with a large majority of our equine population.

While we can no longer debate the question as to whether mouldy food may cause poisoning in horses, with symptoms similar to those described above, we, nevertheless, cannot assume for a moment that it is the one and only factor that may produce a disease presenting similar symptoms. This is especially true because of the fact that the symptoms are of a nervous character. Clinically and pathologically, we have been unable to distinguish the disease which invaded our central western states with such disastrous results, and which has scarcely died out from the disease described in Europe and commonly known as Borna disease. So long as the etiology remains in doubt, there will be more or less discussion as to its exact nature and will be confused with sporadic outbreaks of forage or mould poisoning, to which it is related in my estimation only in that it presents a smiliarity in symptoms. Therefore I repeat the suggestion made at a conference of veterinarians at Lincoln, Nebraska, in September, that the recent outbreak be known as epizootic equine encephalo-

myelitis. This would be at least in accordance with the pathological anatomical features so far observed.

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THE MISSOURI VALLEY VETERINARY ASSOCIATION.—In our December number, on page 324, we announced the meeting of the above association at Kansas City, and gave the tentative dates as January 22-23-24, promising to confirm or correct the same in our present number, those being the dates as nearly as the secretary of the association could approximate them at that time. We are now in a position to state the correct dates, which are, January 21-22-23, 1913 (beginning one day earlier than formerly announced), and to give our readers a little inkling as to the program they may look forward to, as follows: "Surgical Treatment of Bone Spavin," R. R. Dykstra; discussion opened by J. S. Anderson, F. P. Brown and H. E. Bemis. "The Recent Horse Plague," A. Bostrom; discussed by John R. Sprague, K. W. Stonder, B. F. Kaupp, C. H. Stange, B. A. Robinson and A. T. Kinsley. "Embryological Operations, Etc.," J. V. LaCroix; discussion by J. E. May, J. H. McLevey, Roy Lovell, Geo. T. Jungerman, D. H. Miller and W. A. Heck. "Contagious Abortion," B. F. Kaupp; discussed by H. F. Palmer, M. H. Reynolds and J. I. Gibson. Amongst many other features of the clinic will be demonstrations of "scabies" in different animals. Many other papers and the "Question Box" will surely round out a most excellent program. A banquet will be held at the Coates House on one of the evenings, and entertainment will be furnished for the ladies.

CONFERENCE FOR VETERINARIANS AT ITHACA.—The annual conference for veterinarians at Ithaca will be held this year on Thursday and Friday, January 9 and 10, at the New York State Veterinary College. Director Moore extends an invitation to every veterinarian in the Empire State to be present and participate.

APPRECIATES THE WIDE SCOPE OF THE REVIEW.—An Ohio subscriber writes: "In my estimation the REVIEW is indispensable to the practitioner, teacher and laboratory expert."

IMMUNIZATION AGAINST HEMORRHAGIC SEPTICEMIA.*

By John R. Mohler and Adolph Eichhorn, Washington, D. C.

The term hemorrhagic septicemia was first applied by Hueppe, in 1886, as a collective name for all those diseases which were caused by the ovoid bacterium, the *Bacillus bipolaris septicus*. The designation of Hueppe included chicken cholera, rabbit septicemia, hemorrhagic septicemia of cattle and swine plague as the original group. Later investigation proved that there are a number of other infectious diseases in animals, which, directly or indirectly, are etiologically identified with the *Bacillus bipolaris septicus*. Thus, this organism was found to be responsible for the buffalo disease (so-called Barbone), infectious pneumo-enteritis of sheep and the infectious pleuro-pneumonia of calves. This enumeration of diseases does not embrace all affections in which this germ is involved, as there are other infectious maladies, such as influenza of horses, catarrhal pneumonia of calves and distemper of dogs, in which the ovoid bacterium is held to be an important factor. Its association with the latter diseases, however, has not yet been satisfactorily established; nevertheless it is known that some of the pathological changes observed are caused by this micro-organism, and at least it must be considered in these instances as a secondary invader.

All species of domestic animals are susceptible to the infection, although the pathogenic action of the organism for a certain species is usually higher than for other species, and under certain conditions may even be absent; nevertheless it is known that under appropriate conditions the organism may gain in virulence and become a typical pathogenic agent for any of the species. Thus it has been observed that after an outbreak of hemorrhagic septicemia in cattle, hogs have become affected with swine plague

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on the same premises, and likewise the disease in sheep has developed subsequent to an infection of hogs.

It is therefore apparent that the group of these diseases is caused by the same germ, which possesses only a variance in virulence for the different species of animals. This fact is also substantiated by the morphological and biological characteristics of the germ.

These ovoid bacteria live as saprophytes, but under the influence of certain conditions they become parasitic, in which state they sometimes attain a very high virulence. After some generations they gradually lose their parasitic nature and return to their original saprophytic state. As parasites, in their passage through the animal body, they show certain characteristics, as a result of which they are known as a variety of the *Bacillus bipolaris septicus*. Thus, as a rule, the diseases of the different species of animals are caused by these specific varieties, viz., the hemorrhagic septicemia of cattle by the *B. bovisepticus*, swine plague by *B. suisepticus*, chicken cholera by *B. avisepticus*, the disease in sheep by *B. ovisepticus*, etc.

These varieties, however, have a common saprophytic origin, which justifies their being grouped into one family, and all diseases caused by micro-organisms with the following characteristics should be included in this group: Ovoid bacteria without motility, gram negative, polymorphous with involution forms. They do not liquefy gelatine and do not coagulate milk, nor change its reaction. The bouillon cultures have a peculiar odor. On acid potatoes they form no visible growth, and in pancreatic bouillon no indol is formed; they are usually erobic, but may grow anerobically. They produce no spores and have no flagellæ. They possess a greatly varying virulence, which is usually very high. These specific characteristics are invariable, and the absence of any of those enumerated would exclude the organism from the hemorrhagic septicemia group.

The group relation of the organisms of this family is also substantiated by the following observations: Chickens may be immunized against chicken cholera with cultures of the rabbit septi-

cemia organism with the same satisfaction as with the attenuated cultures of chicken cholera (Kitt). Likewise Jensen immunized chickens against cholera with the bacteria of calf septicemia. Mayr and Kitt immunized rabbits against swine plague and chicken cholera with sera of the latter diseases. Perroncito produced a fatal septicemia in calves with inoculations of the swine plague organism. Galtier found swine plague bacteria infectious for sheep, goats, calves and horses. Voges has even succeeded in producing a disease as fatal as cholera in chickens by feeding them swine plague bacteria. Further it has been proven that, in spontaneous outbreaks, hogs may become affected with the virus of chicken cholera. Finally, Lignieres, in his exhaustive experiments, proved the virulence of the hemorrhagic septicemia organism for all domestic animals, in which the most varied clinical picture may result from the infection.

These, together with the findings and observations of other investigators, have established the close relationship of the different varieties of organism of this group. Moreover, through this knowledge it has been possible to prepare a polyvalent vaccine from the different varieties, which gave satisfactory results in the combatting of outbreaks and which is still being recommended and employed in various localities.

Immunization against various forms of hemorrhagic septicemia has engaged the attention of numerous investigators since the time the causative factor was identified. Pasteur was the first to work out a method for immunization against chicken cholera, which, however, failed to come up to the desired expectations. He employed for the immunization an attenuated culture of the chicken cholera organism. The attenuation was accomplished by exposing the cultures to atmospheric conditions for a certain length of time. He found that cultures subjected to these conditions lost their virulence to a certain degree if they were then cultivated at body temperature. The material obtained from this attenuation was then used for the immunization against chicken cholera. The failure of this method in practice can be attributed chiefly to the fact that cultures exposed to this method of attenua-

tion will not in all instances produce a uniform product, and therefore it can be readily understood why in some instances great losses were sustained from the use of such vaccine.

Later, other investigators prepared vaccines for the immunization of the different varieties of these diseases, and while the results were encouraging, they have not in all instances succeeded in their purpose. Lignieres' method appears to have been the most satisfactory, and its utilization in practice has also been probably more extensively adopted than any of the other methods. The method of attenuation he employed consists of growing the cultures of the respective organism at 42 to 43 degrees C. and preparing from the cultures grown at this temperature two different strengths of vaccines. The weaker vaccine is grown for five days at this temperature, whereas the stronger vaccine for the second injection is grown for only two days.

Kitt was the first to establish that the attenuated vaccine prepared from one of the varieties of the germ may also prove effective against other varieties. The proof of this fact is of very great importance in the control of the disease, since it may not make material difference whether the vaccine used originates from the bacteria of the particular variety it is desired to immunize against or another variety. Thus it is possible to immunize chickens against cholera with the vaccine prepared from the organism producing rabbit septicemia.

On the other hand, it must be recognized that immunization against a disease of this group cannot invariably and uniformly be successful with vaccines from another variety of the disease, and it should therefore be considered that the best results can only be expected when the vaccine is prepared from the organism of the same variety. Hence, in all cases where it is possible to employ an autogenic vaccine, such should be used. The preparation of the polyvalent vaccine is highly recommended by Lignieres, and according to his experience it may be used with satisfactory results in practice. The polyvalent vaccine is prepared from a mixed culture of the hemorrhagic septicemia organisms, originating from sheep, cattle, dogs, horses, hogs and

chickens. The culture is grown under the attenuating influences of a high temperature, as described above. The practical application of the polyvalent vaccine is at the present time receiving the recognition of certain workers in the control of the disease among various species of animals.

The serum immunization against these diseases has also been investigated quite extensively. Potent sera can be prepared which will have an immunizing effect against the respective disease, but the application of this method of immunization in practice has not proven practical, since a serum inoculation produces only a passive immunity, which conveys to the animals a resistance that remains for only a relatively short period.

In consideration of the laborious task of preparing a horse to furnish the potent immunizing serum and also the length of time which this preparation requires, one can readily see the advantage which would be derived from a vaccine in preference to an immune serum. This feature was particularly emphasized in a recent experience, where it was necessary to immunize animals within the shortest possible time, in order to prevent further losses from the disease in a buffalo herd.

In the following report our experience with vaccine immunization against hemorrhagic septicemia is described, and in consideration of its success, further applications of this method in outbreaks of hemorrhagic septicemia among other species seem advisable.

Hemorrhagic Septicemia of Buffalo (Barbone).

During the month of December, 1911, the Department of Agriculture received information from the Department of the Interior of the existence of a fatal disease in the buffalo herd in the Yellowstone National Park, with the request that an expert be sent to make an investigation of the disease.

Dr. E. J. Cary, veterinary inspector of the Bureau of Animal Industry, was detailed to carry out the investigation at the park. In all, twenty-two animals died between December 3 and December 15, young animals especially being victims of the disease. The symptoms, and particularly the post-mortem findings, were

confusing, and it was therefore deemed advisable to forward some of the tissues for diagnosis to the Pathological Division. The bacteriological examination as well as test inoculations proved an infection with hemorrhagic septicemia as the specific micro-organism (*Bacillus bipolaris bubaliscpticus*) was isolated from all tissues, and test animals which were inoculated with material from the specimens died of typical hemorrhagic septicemia, the specific organism being also recovered from the blood of these animals.

This disease of buffalo, known also as barbone, was first recognized in Italy, in 1886, while three years later its presence was established in Hungary. No previous outbreak of barbone has been recorded in this country. In Russia, Egypt, Indo-China and the Dutch West Indies the disease occurs frequently in enzootic form, and in the latter place over 11,000 buffaloes succumbed between 1888 and 1891. It usually appears as a disease of the soil in marshy pastures where large numbers of buffalo are kept. Its appearance in such a remote and isolated place as the Yellowstone Park, however, is difficult of explanation, although the bacilli are known to be widely spread in nature and to occur not infrequently in the digestive tract and air passages of healthy animals. As a result of certain unknown conditions, which might include those influences that weaken the resistance of the tissues, as exposure, starvation, anemia, etc., the bacilli become virulent and produce characteristic lesions. It is not an uncommon experience with hemorrhagic septicemia to have it appear periodically in certain localities, without any apparent connection to which the introduction could be traced. The appearance of the disease in sheep reported by Ward in Minnesota might have some bearing on the disease in Wyoming, but if so it would probably be through birds of prey such as buzzards and hawks.

The authorities in charge of the buffalo herd at the Yellowstone Park were immediately notified of the nature and cause of the infection among the animals and preventive measures were recommended for controlling the spread of the disease. At the

same time it was deemed advisable to undertake the vaccination of the entire herd with bacterial vaccines prepared from the recovered organism. For this purpose two vaccines were prepared of different strength. The vaccine for the first inoculation was prepared by growing the organism five days at 42.5° C., while the vaccine for the second injection was cultivated in the same temperature for only two days.

For the preparation of vaccine Erlenmeyer flasks of pepton bouillon media were inoculated with the organism after it had been cultivated for several generations on agar, and the bouillon cultures were then placed under temperature conditions stated above. The straight attenuated culture after thorough shaking was used for vaccinations in some of the animals, while others received the same vaccine to which one-half of one per cent. of carbolic acid had been added. This was undertaken in order to determine whether the preserved vaccine possesses the same immunizing qualities as the unpreserved material.

Two varieties of the hemorrhagic septicemia organisms were utilized for the preparation of vaccine, the one strain representing the germ isolated from the buffalo disease in the Welloystone National Park, while the other was a variety of hemorrhagic septicemia of cattle isolated from animals which died of that disease in Colorado. The vaccines prepared from these two varieties were tested for their potency on laboratory animals and also on sheep, a comparison of the action of the two different vaccines being carefully made.

The virus isolated from the buffalo disease was especially virulent for rabbits. Inoculations of these animals with 1 c.c. of a suspension of salt solution containing only one-fifteenth of a loopful of bouillon culture killed the animals in from 12 to 18 hours, while one-twentieth of a drop of blood from rabbits dead from the disease was fatal to other rabbits in less than 24 hours on subcutaneous inoculations. The virus of the cattle variety was not as virulent, although test animals succumbed to subcutaneous inoculations on the third day, showing on post-mortem examination the characteristic manifestations of the disease.

Both strains of vaccines were employed in parallel tests on a group of rabbits and also at the same time on sheep. For immunizing purposes subcutaneous injections of the vaccines were given to the animals at ten-day intervals. For the first vaccination the more attenuated, and for the second vaccination the less attenuated vaccine was injected. The injections invariably were made subcutaneously on the inside of the thigh. The dose for the rabbits was .2 c.c. per injection, while the sheep were given .7 c.c. of each vaccine. Likewise another series of animals was tested, using the same amount of a vaccine which was preserved with 0.5 per cent. carbolic acid.

On the sixth day following the second inoculation the immunized animals were given a subcutaneous injection of the pure culture of the organism. Those which were immunized with the buffalo variety were injected with the virulent culture of this organism, while the others received the cattle variety. At the same time check animals which were not immunized were employed for each group and these were injected with the same quantity of virulent culture as given to the immunized animals. The immunized rabbits failed to show any indication of disease from the injection of the virulent culture, while the control animals succumbed in the usual time. The same results were noted in the sheep, although one of the immunized animals showed a slight elevation in temperature which, however, subsided after one day. On the other hand, the control animals of this group succumbed to the infection with typical symptoms and lesion of the disease. The fact that the animals immunized with the carbolized vaccine showed the same immunity as those immunized with the straight attenuated cultures is an interesting feature of this experiment, and while this condition appears at first hand to indicate the advantage from the use of the preserved vaccine, subsequent complement fixation tests undertaken on these immunized animals showed that those animals which were immunized with the straight vaccine gave a partial fixation of the complement for a much longer period than those which were immunized with the carbolized vaccine.

The results of these tests further substantiate the view that the vaccines of one of the varieties of the organism are potent against diseases produced by the other varieties of the germ. Thus rabbits and sheep were successfully immunized with the vaccines prepared from the *Bacillus bubalisepticus and the Bacillus bovisepticus.*

After obtaining these favorable results the vaccine was sent to the veterinarian entrusted with the vaccination of the buffaloes, and instructed to vaccinate all animals of the herd by the same procedure at ten-day intervals. One cubic centimeter of the vaccine constituted a dose for each animal.

Following vaccination, the herd was carefully observed and no immediate effects were noticed from the vaccination, and up to the present time there has been no indication of the recurrence of the disease among the buffaloes.

In the progress of the preparation of the vaccine experiments were also conducted in the laboratory to determine whether the complement fixation test could be applied for the diagnosis of the disease, and also for the purpose of determining the relative degree of immunity conferred upon the vaccinated animals in artificial immunizations. An antigen was prepared from the original organism recovered from the outbreak among the buffalo in the form of a shake extract. The hemolytic system consisted of sensitized rabbit serum (amboceptor), guinea-pig serum (complement), and washed sheep corpuscles. The test was employed with sheep serum and rabbit serum of artificially infected animals, and the results proved entirely satisfactory. A complete fixation was obtained in all instances when applied to 0.1 c.c. of serum of infected animals, while the controls showed no fixation whatsoever.

After the vaccination of the sheep and rabbits, blood serum was obtained from these animals and tested with the complement fixation test. The results in these instances also showed a fixation of the complement, although not as complete as in the infected animals, nevertheless showing that the animals responded after vaccination with the production of immune bodies. This

reaction has been noted even three months after the vaccination, and the testing of the blood will be continued from time to time in order to determine the length of the period in which the animals possess immune bodies subsequent to vaccination.

The utilization of the complement fixation test in the diagnosis of hemorrhagic septicemia, and also its value in determining the relative immunity established by vaccination, is of great importance, not alone in this disease, but also in the possiblity of its utilization for other diseases.

PHYSICIANS AND VETERINARIANS A UNIT IN PREVENTIVE MEDICINE.—The following letter from past-President De Vine of the United States Live Stock Sanitary Association, expressing approval of and perfect accord with the sentiments expressed in the address of his successor, Dr. Ravenel, seems to so clearly demonstrate the views that each personally advocates, the one being a veterinarian and the other a physician, that we have taken the liberty of reproducing it. Dr. De Vine says:

"President Ravenel's address was extemporaneous and his remarks were chiefly concerning the relation of bovine to human tuberculosis and the great importance of bovine tuberculosis as a public health problem. He cited the findings of the Royal Commission in which it was clearly shown that bovine tuberculosis is transmitted to mankind, even the pulmonary form in exceptional cases; also the very valuable report of Dr. Park on the same subject. In fact his remarks up to this point were practically identical with the subject as I gave it in my annual address this year at our State meeting (New York). He further pointed out the necessity of the union of the medical and veterinary professions on health problems and stated that at the last meeting of the National Society of prevention of tuberculosis, of which Dr. Ravenel was President, that resolutions were passed inviting members of the veterinary profession to join the society and take part in the program; he also advocated the union of the professions under one Federal head to deal with national health problems.

"Following Dr. Ravenel, Dr. Geo. B. Young made a short and sincere address of welcome showing plainly his knowledge and sympathy of the work we are engaged in. Dr. Bahnson the Southerner, who can make more faces telling a story and do it right than any man I ever saw, responded in his usual way by putting facts so that they sounded as pleasing as fiction; until he reached the statement which to most Northerners was startling when speaking of Southern cattle fever; he said the cattle tick cost the Southern States $15,000,000 by death and approximately $100,000,000 by loss of commerce with other states annually, and that with our present knowledge of the life and methods of destruction of the tick, that eradication could be made possible and positive for the expenditure of a quarter of the amount of the annual loss, if war against the ticks were waged intelligently and persistently for a few years. He says that the presence of the ticks is entirely due to the indifference of the people and the lack of application of regular dipping of the cattle which is now the key of solution."

SOME OF THE MORE IMPORTANT INSECTS AFFECTING OUR FARM ANIMALS.*

By W. H. Dalrymple, M.R.C.V.S., Louisiana State University.

The subject is such a comprehensive one that it would be a physical impossibility to more than scratch the surface, so to speak, in the time usually consumed in an ordinary paper, and even then I am afraid I will have to boil the subject-matter down to the limit of a synopsis, rather than anything approaching an exhaustive treatise, as, within the past decade or two, insect life has been found to play a much larger part in the transference of disease than was hitherto even dreamed of.

Many years ago I personally had gained the impression that as time went on it would be found that insects, especially flies of different kinds, were responsible for the conveyance of many of the communicable diseases, but which at the time had, perhaps, not been suspected, or at least the suspicion had not gained very wide publicity. Perhaps I was led to this impression through my conection with anthrax in the lower Mississippi valley and its widespread character in certain seasons, particularly those in which tabanids, or horse-flies, were exceptionally numerous.

True, the horse-fly had been credited with the causal agency of this disease, but the erroneous idea prevailed that the disease originated wholly with the fly and that it was the sole cause of the ailment rather than the mechanical transmitter of the *bacterium anthracis*.

Our impression at that time, with regard to insect transmission, seems to have been more or less verified in the numerous diseases that are now known to be dependent for their spread upon flies and other dipterous insects, either as mechanical transmitters or as obligate hosts of some of our most important disease-producing organisms.

* Paper presented at the thirtieth anniversary of the Illinois State Veterinary Medical Association, Chicago, December 6, 1912.

I do not wish you to get the impression that it is my desire to pose as a professional entomologist. You are all well aware that this branch of science is one to which an individual must devote his entire time, in fact his life, in order to become at all proficient. Consequently, while I have been able to embody some of my own personal experiences and observations in the makeup of this paper I have been forced to draw copious draughts from the fountain of knowledge acquired by those who have made a special study of insect life in its different phases.

It is not my purpose to go into a systematic grouping of parasitic insects, as this would occupy much more time than I have at my disposal, nor do I think it at all necessary in a paper of this kind. I believe that the selection of one or two of the more important orders, with a few of their families, will be all that we will be able to cover at this time; and the first which I propose to discuss is the order diptera, which includes flies, gnats, mosquitoes and pseudo-ticks.

The insects of this group are readily distinguished by their having only one pair of wings, the second pair, common to other insects, being represented by a pair of rudiments or modified structures called halteres or balancers.

In many of the parasitic forms, however, the wings are entirely wanting, as in the sheep tick (melophagus ovinus), etc. They have suctorial mouth parts, and in the forms attacking the various animals these parts become readily adapted to penetrating the skin in order to reach the small blood-vessels.

The larvæ are fleshy grubs, or maggots, or slender worms adapted in the different families to widely different conditions of existence, but in nearly all cases requiring some degree of moisture.

In this respect they range all the way from the entirely aquatic mosquito larvæ to the forms which mature in comparatively dry situations in earth, or even upon plants.

The pupæ are, in some cases, formed by the simple contraction or hardening of the larval skin, and in disclosing the imago may either split on the dorsal surface or in a circular manner, so

that a cap is separated from the head end, leaving a round aperture through which the adult emerges.

While comparatively few are parasites in the strict sense, the group includes many of the most troublesome of the insect enemies of live stock.

Muscidæ is the family of diptera to which our common fly belongs, and I have thought it might not be out of place to briefly consider that pest, to both man and beast, as well as a carrier of disease germs of no mean ability—the common house fly (musca domestica).

It is claimed by entomologists that the egg-mass of the female house-fly will contain about 120 ova, and that a single fly will lay four such batches of eggs. The life cycle of this fly is ten days, and in the latitude of Washington, D. C., for example, according to Dr. L. O. Howard, Chief of the Bureau of Entomology, the generations will number twelve or thirteen in a single season. In the longer warmer seasons, such as we have in the more southerly part of the country, the number of generations are, no doubt, considerably increased.

We are all familiar with the great prominence this pest has gained in recent years in connection with the transmission of some important disease of the human family, such as typhoid fever, dysentery, infantile diarrhœa, etc. However, in the case of animals, apart from its irritating and annoying effects, it may not have been reckoned at its true value as a transmitter or carrier of some of our most fatal infections.

Only recently at the Louisiana station we have been able to verify, to some extent, at least, the veracity of this statement during the course of some experiments with possible carriers of anthrax infection. Dr. Harry Morris, assistant veterinarian and bacteriologist of the station, when posting a guinea-pig that had died of anthrax, observed a common house-fly feeding upon the viscera in the abdominal cavity of the pig. Having a petrie dish with agar medium convenient, he succeeded in getting the fly on to the culture medium in the dish; and after incubating this for a period of 24 hours, there could be seen colonies of

anthrax organisms at every point the fly had touched with its feet.

Here then was a case of infection by simple mechanical transmission. But another test was made of a somewhat different character. A fly that had been fed virulent anthrax culture in a large wide-mouthed bottle was transferred at intervals into three other sterile bottles in order to prevent contamination, and from the side of the last bottle a single fly-speck was carefully transferred to fluid agar, shaken up and further transferred to a sterile Petrie dish. This was incubated for 48 hours, with the result that the entire field was covered with anthrax colonies.

From the above-mentioned tests it may readily be inferred how the common house-fly may not only be the mechanical bearer of this death-dealing infection on its feet and the hairy undersurface of its body, but carry in its dejecta and deposit, when nature calls, the organisms of this disease, which is often so fatal to both man and beast in various parts of the country. And if this is possible in the case of anthrax, may it not also be so in hog-cholera and other diseases of animals that have not as yet been fully investigated in this connection?

In dealing with this fly it is necessary, of course, to get at its breeding places and endeavor to destroy it in the egg and larval stages. It breeds chiefly in horse manure, although it may be found in trashy places about yards, in closets, etc. This would suggest, therefore, the treatment of manure, when practicable, with some effective inexpensive insecticide, such as chloride of lime, its removal at the earliest possible moment, sanitary cleanliness generally, and the screening of stables, when that can be accomplished.

Another representative of this family is the stable-fly, biting or stinging fly (stomoxys calcitrans).

To the uninitiated, this fly so closely resembles the common house-fly as to be considered one and the same, only they (the uninitiated) are at a loss at times to understand why this fly should get fits of biting or stinging. This, however, is an error, as the two are quite distinct.

This is a well-known species, is widely distributed, and is a familiar pest in many countries. It is said to have been described by Linnaeus in 1761. Its bite is severe, a great amount of annoyance is caused by it to our domestic animals, and it is frequently very troublesome to people working in the vicinity of where it abounds. In fact, it was announced by Prof. M. J. Rosenau, of Harvard University, at the recent International Congress on Hygiene and Demography in Washington, D. C., that he had apparently succeeded in transmitting poliomyelitis, or infantile paralysis, from sick to well monkeys by the bite of this fly. Dr. Rosenau concluded from his experiments that after the virus of poliomyelitis is taken into the body of the fly by biting an infected person or animal some time must elapse before the fly is capable of transmitting the disease, and that the period which must elapse is probably less than 21 days.

It would seem that this fly appeared in great numbers in different parts of the country during the present year and occasioned considerable damage. Mr. Bishopp, assistant in the Southern Field Crop Insect Investigations in Texas, kindly furnished me a memorandum of some of its depredations. It seems to have appeared in great numbers in the north-central part of Texas and certain parts of southern Oklahoma, also in Kansas and Nebraska. It is difficult, says Mr. Bishopp, to estimate the loss chargeable to this outbreak. The loss due to the death of cattle, mules and horses was by no means inconsiderable, probably 300 head would be a conservative estimate, the greater number being among cattle. Many of the deaths, however, were only indirectly due to the fly, among which might be mentioned runaways caused by the irritation of the bites. One of the most important indirect losses was caused by the inability of the farmers to make fall preparation for their winter wheat at the proper time, as it was frequently impossible to work their animals in the fields during the daytime. In the case of dairy cows, the great loss was due to the reduction of the milk supply. This reduction ranged from 40 to 60 per cent. in many herds. And there was also a corresponding falling off in the weight of animals everywhere throughout the afflicted districts.

Prof. Herbert Osborn, of Ohio, and others state it is especially charged against this species that they have been the means of transmitting anthrax and possibly other diseases among cattle.

This author also mentions that this fly is not confined to stables or other quarters of domestic animals, but occurs frequently in shady places, groves, and in dwellings, especially in cloudy weather. It is claimed, however, that the species has been reared with others from horse manure, and it may be considered as established that the eggs are laid in manure, and the larval stages passed there, requiring greater or less time for their development, a number of generations being produced each year.

The prompt disposal of stable accumulations would, therefore, assist greatly in reducing the numbers of this pest. For if, as Dr. Rosenau states, the virus of poliomyelitis has to remain in its body for a length of time before it is capable of transmitting the disease; and the further fact, according to Curry, in Manila that it is the principal agent in the transmission of the trypanosome of surra, it is possible that we have in this fly a carrier which is much more dangerous than has hitherto been suspected.

Another important member of the family Muscidæ is the horn-fly (hæmatobia serrata).

This is one of the worst of the European biting flies that attack cattle, but nothwithstanding the large number of importations of live stock from that continent to this during nearly three centuries it was only discovered and reported to the U. S. Bureau of Entomology in the fall of 1887 as occurring near Camden, N. J. The following year it appeared in Maryland and Virginia, and by 1891-1892 it was found over the continent from Canada to Texas and from Massachusetts to the Rocky Mountains. In 1897 it was carried with cattle from the Pacific coast to Honolulu, and from there spread to all the islands of the Hawaiian group.

During the past summer this fly has been exceptionally abundant in the Gulf States and, presumably, in other sections of

the country, and the damage done has necessarily been proportionate to the numbers of the insect.

Being a blood-sucker, the chief damage is occasioned as the result of irritation, preventing proper feeding and the normal assimilation of food and, in consequence, the loss of flesh or lessened milk production. There is also, of course, the actual loss of blood, which may be quite considerable when these flies are abundant, as they have been the past summer. And we in Louisiana are somewhat suspicious that during outbreaks of anthrax they may, as mechanical transmitters, be factors in the spread of this infection.

Except when these insects are in great abundance they seem to have a preference for dark-colored cattle, or the dark portions of the same animal that may have both dark and light patches, such as the Holstein. This is no doubt due to mimicry, or the natural instinct to protect themselves by taking advantage of the color of their surroundings being similar to their own.

When feeding, the horn-flies generally attack the sides of the chest and other parts where it is difficult for the animal to reach with head or tail; and when disturbed on one side, they move over to the other, and keep this up until they become satiated, and the animal frequently worn out by its almost constant efforts to rid itself of the pest.

In the resting stage, the flies frequently cluster around the base of the horn, in horned cattle—hence the name, horn-fly.

According to Marlatt, the egg-laying habit of this insect was not easily discovered, and is somewhat peculiar. The eggs are laid singly, and usually upon their sides on the surface of wet cow manure. So far as is known, they are laid upon no other substance, and never upon old droppings. The moment the manure is dropped, a swarm of flies dart from the animal to the manure and remain there a few seconds, or a minute at the most, during which time many eggs are deposited. Egg deposition is chiefly during daylight, and most abundant during the warmer morning hours.

The larvæ upon hatching descend into the manure, remaining,

however, rather near the surface. The puparium, or pupa, is found in the ground underneath the droppings. The time elapsing from the egg to the adult is from 10 to 17 days, and in the latitude of Washington, according to Marlatt, there are probably seven or eight generations annually, with more in the South, and continuous breeding in tropical regions, like the Hawaiian Islands.

Studies of the winter habits of this insect would indicate that hibernation takes place either in the adult stage or in the pupa below the surface of the ground.

It seems to have been established by the Bureau of Entomology that some of the natural enemies of this fly have been discovered.

However, the simplest practical method of control, so far as we are concerned at the present time, would seem to be the destruction of the larvæ and pupæ in the cattle manure by direct measures, the protection of cattle by suitable repellents, and the actual destruction of the adult flies.

Since using the alkaline arsenical solution for the destruction of cattle ticks in the South, it is found that great numbers of these flies hang on to the animals and are killed in the ordinary process of dipping in the vats. But while myriads of adult flies are destroyed in this way, dipping for tick destruction is only practiced every 14 to 21 days during the season, leaving too great an interval between to be of the greatest practical service. Consequently, some additional method should be adopted that could be practiced at short intervals, or a system of dipping with insecticidal materials that would serve the purpose without injuring the cattle.

There are various mixtures recommended to be used as sprays, and the old standard insecticide, kerosene emulsion, still seems to be one of the best for this purpose.

Under range conditions, however, the ordinary dipping vat is being so modified with high splashboards, etc., as to form a fly-trap, so that when the animal plunges in, the flies which escape immersion go to the upper part of the vat, and are killed by the spray made by the animal when it plunges into the solution.

Some other methods are in vogue, such as driving the cattle through a large cylinder, through the sides of which a powerful gasoline pump causes sprays of an effective insecticide to strike the animals from all quarters and thoroughly wet them.

These latter methods, of course, destroy adult flies in great numbers, but wherever practicable the other, and very important method of destroying the maggots and pupae in the fresh droppings should not be overlooked, in order that greater headway may be made in the control of this pest, which is costing the country so much in the aggregate.

Some years ago the screw-worm-fly, chrysomyia macellaria, was a veritable plague in the Gulf States. However, since about 1891 or 1892 we don't seem to have been troubled with it to any extent as a severe pest to our farm animals. While its habitat is given as from Canada to Patagonia, the greatest damage from it has been within the tropical and sub-tropical belt.

During the years of its greater prevalence, not only animals but human beings also suffered from its ravages.

The fly lays a mass of some three or four hundred eggs on the surface of wounds, which, in a few hours, hatch into larvæ, and these make their way directly into the wound where they feed on the surrounding tissues until full grown, when they come out, drop to the ground where they pupate, and later the adult fly emerges. Any fresh wound, however small, seemed sufficient to attract this fly at the particular period mentioned. The greatest sufferers seemed to be the young creatures, such as foals, calves, etc., while their umbilical stumps were still in a raw state, and the openings still unclosed. Eggs were laid on these structures, and in a few hours the larvæ had gained the abdominal cavity, with enormously fatal results.

(*To Be Concluded in the Next Number.*)

DR. JAS. CAMPBELL, one of the old-time readers of the REVIEW, located at Henderson, Ky., has recently been called to his maker.

THE VETERINARIAN AS A SANITARIAN.*

By Dr. E. Pegram Flower, D.V.S., Baton Rouge, La.

The qualified, progressive practitioner of veterinary medicine to-day occupies an enviable and unique position in the world of science.

As graduates of modern veterinary colleges, maintaining a curriculum that includes courses in pathology, bacteriology, meat inspection, milk and dairy inspection, quarantine and hygiene, subjects that are of especial importance to sanitarians, in addition to thorough courses in anatomy, physiology, medicine and surgery and the related collateral sciences, the veterinarian is peculiarly fitted as a sanitarian and public health officer.

The number of veterinarians employed as sanitary officers for the various states of the Union are legion, and have accomplished much indeed in the preservation of the health of animals in their respective states and indirectly of the people. Other veterinarians have rendered efficient sanitary service to many towns and cities in the capacity of milk and meat inspectors, but the principal benefits obtained by city milk and meat inspection alone have been in the general improvement of sanitary conditions, and consequently the maintenance of human health. A considerable part of the health in general of the live stock of our country, and indirectly of the health of the people, must be attributed to the qualified, energetic, wide-awake local veterinary practitioner, who effectively protects his community from the ravages of contagious and infectious diseases of live stock, communicable to man.

There are many diseases of the lower animals that are also common to the human family, such as anthrax, glanders, rabies and tuberculosis, and the veterinarian is indisputably best qualified to identify these diseases in the animal and to properly quar-

* Presented to the Louisiana Veterinary Medical Association, at New Iberia, October 2, 1912.

antine, destroy, disinfect and prevent the spread of such diseases to man. Anthrax, a disease affecting practically all mammals and extremely prevalent in our state annually, is transmissible to man by inoculation through wounds or abrasions, caused or produced generally from handling infected animals, or skinning carcasses that have died of anthrax. There have been numerous fatalities in various sections of our state during the past several years from this dire malady.

Glanders, a disease which chiefly affects horses and mules, is also communicable to man. Only three weeks ago I was called to the parish of Winn to inspect a markedly suspicious case of glanders in a small bay mare, the owner of which had only a few days previous died of an acute case of glanders. This animal was found affected with a chronic case, and had there been a trained veterinarian adjacent to this community, or earlier available, his attention would undoubtedly have been directed to her condition. The resulting diagnosis and complete control of the situation in its incipiency, by the proper adoption of sanitary regulations by one versed in comparative pathology, would have been the means of obtaining one human life from death's toll.

While our Live Stock Sanitary Board requires the reporting of infectious diseases by any citizen who may be aware of its existence, failure to do so is often the case through ignorance of the law, or perhaps of a lack of due responsibilty.

Rabies, a disease common to the domestic animal and man, and mainly transmissible by means of the saliva and other secretions, can by the surveillance of the vigilant veterinarian be efficiently controlled in its incipiency in his community. The proper adoption and enforcement of sanitary regulations, which are too well known to the trained sanitarian to expatiate upon here, together with co-operation from the municipal authorities, are the means whereby serious outbreaks of this disease are prevented or suppressed.

That tuberculosis is transmissible to man from lower animals is now a recognized fact. At the recent meeting of the seventh International Tuberculosis Congress, held in Paris during the

early part of the current year, the opinion of prominent investigators connected therewith and so expressed, indicate that bovine tuberculosis is transmissible to man, especially children. That ten per cent. of the cases of human tuberculosis proceed from infection by bovine tuberculosis. That the majority of cases of human tuberculosis proceeds from contagion between human beings, and that it is necessary to maintain and even increase the precautionary measures already taken against bovine tuberculosis. The wide publication of these investigations should awaken health authorities and the general public to the need of more effective regulations and of scientifically trained veterinarians for their enforcement. It seems superfluous to argue the need of municipal meat and milk inspection. The many instances of meat poisoning from the ingestion of putrid fish and meat, outbreaks of typhoid fever, scarlet fever and other diseases, transmitted through the medium of milk, together constitute, in my opinion, an irrefutable argument for efficient municipal food inspection that cannot be denied. Milk and dairy products are now extensively used as human food; from one-sixth to one-fifth of the food consumed by the people in the nation is derived from the dairy cow. There is probably no one more adequately informed than the trained veterinarian respecting a knowledge of milk: the source of its contamination and the changes which it undergoes after leaving the animal. In addition to this definite knowledge of the diseases of cattle, of stable sanitation, of milk from the standpoint of a laboratorian, he is in a position to command attention and respect from the dairyman. If he is tactful, an attitude of mutual helpfulness and co-operation can readily be established by endeavoring to make the work essentially educational, and not a police supervision with harsh orders and mandates that court the opposition rather than the willing acquiescence and co-operation of the dairyman. To instill enthusiasm in the efforts of the dairyman by endeavoring to demonstrate that a fairly superior quality of milk is possible from a meagre equipment, by a change of methods and conditions, especially where the desire is evinced to try, will be in the end productive of lasting success.

Milk-borne typhoid fever is charged from statistics with about one hundred thousand cases of this disease annually in the United States. It is an indisputable fact that scarlet fever and diphtheria are readily and often transmitted through milk, and it is also a fact that through milk-borne endemics these two diseases pay a heavy mortality toll annually.

The conservation of the health of the people is now a problem receiving the universal attention of the best authorities in every civilized nation, and the interest manifest in this consideration by the veterinary profession relates to the control and eradication of the various infectious diseases of animals and to the safeguarding of the milk and meat supply.

The evolution of the modern practitioner of veterinary medicine, of the sanitarian trained in comparative pathology, from the old " Hoss Doctor " of several years ago, up to the present scientific standard, has been comparatively slow, but nevertheless remarkable. Now, in the place of such characters of the old régime have appeared well-educated gentlemen, who, by their uprightness, fair dealing, courteous attitude and unimpeachable character, have convinced the public that the profession deserves and must obtain a more exalted position in the public mind. The public has been fast to recognize the justness of this position and has accordingly advanced our practitioners to a position far superior to that occupied a decade ago, and will continue to advance us just as fast as we demonstrate that we are entitled to it.

To the man who specializes in comparative medicine, the humane service that he renders in alleviating the sufferings of our dumb animals, and his economic value in preserving the life and usefulness of man's most faithful and efficient servant, the horse, from diseases not due to specific infection, is sufficient in itself to have earned for him the gratitude due a real benefactor of both man and beast. Legislation relative to veterinary requirements and privileges is annually being enacted in the majority of the states, and as the lines are gradually more and more closely drawn, the poorly trained man finds himself woefully in a class unto himself. The value placed on a preparatory education is

also increasing at a surprising rate in every line of work, and we may safely assume that the business-like, intelligent farmer is fast discerning the distinction between the man thoroughly trained for his profession and one who has jumped high and blindly, or who has taken a short cut to a professional degree.

The sanitarian in his rural practice in the past has been much handicapped by lack of legal or state regulations prescribing penalty for their enforcement. Consequently, there has not been the amount of necessary attention devoted to this particularly important line of work regarding live stock sanitation as there could have been. To-day, however, with a most excellent law available for the regulation of contagious and communicable diseases of live stock, placed in the hands of your Live Stock Sanitary Board for their enforcement, there is a mutual interest of cooperation evident between veterinarians, the parish authorities, the parish and state health boards and the Board. After many years of toil and effort, with, however, attending disappointments, to have effected a state law for the control and eradication of contagious diseases of live stock, those gentlemen who have worked so indefatigably toward this end (and I refer especially to our prominent colleague, Dr. Dalrymple) were at last rewarded by seeing the passage of Act 274 at the hands of the Central Assembly of 1908, creating the Live Stock Sanitary Board. For the first two years following its passage, however, there could be but little accomplished, due to an entire absence of appropriation. The following General Assembly, two years since, allowed an appropriation for eradication of the fever carrying cattle tick, and the production of hog cholera serum, but absolutely no provision for control or sanitary work. The past General Assembly, only recently convened, were, by importunity, entreaties and forcible arguments from representative live stock owners and agriculturists over the state, prevailed upon to vote an appropriation for this work. This available fund, though, while not princely, amounting to approximately twenty-five thousand dollars per year, has nevertheless enabled us to assume charge of several situations without delay, where apathy or procrastination

would have been serious. It has been the custom of the Live Stock Sanitary Board to deputize as its representatives and inspectors those qualified veterinarians adjacent to the locality of reported outbreaks of probable pathogenic maladies, when such action is deemed imperative. These veterinary inspectors, as representatives of the Board, and endowed with the same official power as the executive officer of the Live Stock Sanitary Board while in the discharge of such duties, are in a position to promptly and peremptorily adopt requirements suitable to the exigencies in the premises necessary to control, suppress or eradicate the prevailing infection. When the duties of the various parish officials, as prescribed by law, in connection with enforcement of these regulations, are explained and demonstrated, there have been, with but one or two exceptions, complete co-operation and material assistance rendered on their part. The old adage that an ounce of prevention is worth a pound of cure has special application in sanitary medicine. The veterinarian with his training in comparative medicine should be naturally an efficient sanitarian in the maintenance of health of the domestic animal, and as such is accordingly in a position to conduct an available campaign educationally, throughout the rural districts where agricultural interests and live stock abound, while in the discharge of his erstwhile professional daily duties.

Our work must go forward by three parallel and seemingly important lines: First, combating disease wherever found and by every known agency; second, fortifying the body by its natural defences and other agencies; and third, waging a relentless warfare against pathogenic micro-organisms.

I do not wish you to infer from the foregoing discussion of this subject that the veterinarian alone is the only one capable of officiating as a public health officer, or that he alone should be responsible for the preservation of the health of the public. The various phases and conditions, in which the veterinarian is and should be a factor, have been argued, but the conservation of the health can be brought to the highest standard by the co-operation of the veterinarian and the physician. Each has his particular

field, and while they are essentially combined ultimately in the great question of prophylaxis, freedom of consultation and discussion of paramount issues with each other will be of untold benefit.

Having been shown that many of the diseases of animals are transmissible to the human, and that there are many diseases and diseased conditions that originate in the domestic animal or in the products of these animals, it seems only evident that veterinarians should act in the capacity of sanitary officers, especially as milk and meat inspectors, and that every well-regulated board of health should have among its members one or more veterinarians.

Kansas Veterinary Association.—Secretary James H. Burt, of the above association, wishes to say to the veterinary profession of Kansas, through the Review, that everything is being arranged for an excellent meeting at Topeka on the 7th and 8th of this month, and the profession of the state should come out in a body.

A Big Mule.—The following clipping from the *Breeders' Gazette* of November 13 is an example of what can be produced in the shape of a mule by proper selection of mare and jack. The mule stood 17 hands high, was smooth and shapely, and weighed 2,010 pounds at the time the man who raised it sold it for $500 as a four-year-old. "The famous big mule which was destroyed in a fire in Trenton, Mo., last summer weighed in good condition 2,010 pounds at four years old. The dam was a Shire mare weighing 1,600 pounds, and the sire was a 16-hand big-boned Kentucky jack weighing 1,200 pounds. At one year old the mule weighed 1,400 pounds, and gave evidence at that time of great stretch of frame and immense size at maturity. At two years old the weight was 1,675 pounds. The third summer this mule was worked on the farm, and continued in the harness until sold at four years old to the Missouri Auction School. At three years old the weight was 1,790 pounds, and at four years old 1,890 pounds." * * *

STANDARD, PURE AND POTENT BIOLOGICAL PRODUCTS.*

By C. A. Cary, D.V.M., State Veterinarian, Secretary of State Live Stock Sanitary Board, Auburn, Ala.

The multiplicity of biological products that may be found on the market causes the public to open its mouth, buy, devour, suffer, get relief, or get no action, paying the price regardless of results. Even the general medical profession becomes now and then disgruntled, if not disgusted, with the great list of semi-patent biological products that smack of sweet and easy quackery. All that is required is a little pressure of the hypodermic syringe, and the mysterious biological product will do the rest. But why this variety of products that are said to be the same? The differences or variations in purity and potency are due to the care, honesty, ability and facilities of the maker of the biological products.

For instance, take the history of tuberculin and its record of twenty-two years has been a variable and checkered one because of its commercial value and variety of makers. Some of the erroneous records made by using it as a diagnostic agent, not to say anything about its use as a curative agent, have been due to impotent tuberculin that was forced on the market before it was standardized or tested.

Again, look at anthrax vaccines. Doubtless the indiscriminate sale of anthrax vaccines to the laymen, and possibly to professional men, has been the means of disseminating anthrax, especially where the germs were not properly attenuated. In all cases where such vaccines as anthrax are to be used, there should be no possible doubt about the strength or degree of attenuation, and then they should not be placed in the hands of the inexperienced and technically ignorant. In fact, the use of anthrax vaccines should never be permitted until a positive biological diagno-

* Presented to the forty-ninth annual meeting of the American Veterinary Medical Association, at Indianapolis, August, 1912.

sis has been made by a competent expert. The Alabama Live Stock Sanitary Board has a regulation demanding that a positive diagnosis of anthrax be made by some recognized state authority or by the Bureau of Animal Industry before anthrax vaccine can be used even by professional men.

The well-known outbreak of foot-and-mouth disease is said to have been brought about by the mistaken use of contaminated and infected smallpox virus that was used by a commercial factory of biological products.

If accurate records could be secured, it would be very interesting, if not astonishing, to find how many failures, mistakes, actual, serious infections and impotent results have obtained from the indiscriminate manufacture, sale and use of nearly all biological products. Why should such a hazardous, heterogenous state of most important affairs be left the variables and unknown quantities in commercialism, when there are ways and means by which the medical profession and the public may be protected, without unduly restraining commercial trade.

The best way out of this perplexing difficulty is to place manufacture and sale of all biological products exclusively into the hands of government. Public good, public welfare and public health demand it. Some assert that such a procedure would lead to paternalism. But the results to be obtained are solely for the good, the welfare and the protection of the public; and consequently the end justifies the means. Moreover, the means or method is also correct and in every way right. The law regulates quarantine, the manufacture and sale of poisons and such drugs as cocaine, morphine, opium, strychnine and arsenic; why not biological products that are used in the treatment and protection of animals? There are many good reasons why the government should manufacture and regulate the sale of all biological products. The government can secure the best experts, whose salaries need not depend upon commercialism. Here some one may claim that politics would influence the work of the expert. The same can be said of the commercial manufacturers of biological products. They have been known to play political hands. Moreover,

the biological workers at Washington have had almost an unlimited tenure of office. Again, governmental authorities can secure the best materials and facilities, and can thus as near as possible make a constantly standard biological product.

Another plan would be to have the government and the various states make the biological products. In some things, like hog cholera serum, this plan might work equally as well, and in some ways better than to have the government make all the serum. Yet it might mean as many kinds of serum in purity and potency as there are states. However, there can be co-operation of states, and then the standard could be uniform.

There is still another way of controlling the output of biological products. It is the one that is now in force regulating the manufacture of biological products used by the human family. The manufacturers obtain a license from a government department, and this department periodically tests the products of licensed houses and thus forces them to make standard products. This method has greatly improved the products used in human medicine. Yet there are loopholes and defects. The government department tests only a few of the products made by the private or commercial house, whereas, if the government or state were making it, every "batch" or combination of "batches" would be tested.

In January, 1912, the Alabama Live Stock Sanitary Board, at the writer's request, promulgated a regulation which required the manufacturers of the biological products to be sold in Alabama to obtain the endorsement of the Bureau of Animal Industry. Some of the B. A. I. men looked upon this favorably, but the Secretary of Agriculture said that there was no federal law and no money to enforce control over the making of biological products. Dr. Melvin wrote me that there was an attempt being made to have a law passed giving the Bureau of Animal Industry a license control over the making of veterinary biological products. It is to be hoped that it, or some other good federal law, will be passed and put into effect at an early date.

I do not wish to imply or to assert that much good has not

been done by the manufacturers of biological products. In fact, they have done a great deal that could not have been accomplished without their work, but some of them—in fact, nearly all of them —have pushed the commercial idea to such an extent that they are advertising and selling products in a way that is not commendable, not to say anything about the medical or scientific aspect of the work. In fact, if the best houses now in existence would eliminate the semi-patent medicine advertisements and the "quack" testimonials, and then standardize their products according to some fixed government standard, they would certainly improve and be second only to the actual government manufacture of the products.

Dr. John F. Winchester, of Lawrence, Mass., represented his city at the "National Conference of Housing," held in Philadelphia December 4 to 6, 1912, and we find his name heading a list under the caption "Many Noted Speakers" in the *Philadelphia Record* of December 5. Dr. Winchester, who occupied the unique position of being the only veterinarian who participated in the conference, which had for its purpose the betterment of the housing conditions of the poor in the cities, was the official representative from the Department of Health and from the Department of Charities of the city of Lawrence, and his report to Alderman Robert S. Maloney, Director of Public Health and Charities, on his return home, was right to the point in regulation Winchester style.

Veterinary Surgeon Breeds Percherons.—On December 20 we were honored by a call from Dr. W. T. Patton, of Coutts, Alberta, Canada. Dr. Patton, who for a number of years served under Dr. John G. Rutherford in the "Health of Animals Branch" of the Canadian Department of Agriculture, resigned from the service some time before his chief resigned, to take up the breeding of percherons on his ranch at Coutts, Alberta. The doctor reports the outlook for draft-horse breeding as excellent, the markets being good. After a couple of weeks in the American metropolis, he will return to his ranch, which demands his careful attention.

HEMORRHAGIC SEPTICEMIA.*

By S. H. Ward, St. Paul, Minn.

Mention of this peculiar disease of cattle and sheep is rarely seen, even in the most recent text-books. Hutyra and Marek, perhaps, give the most concise account of the disease, yet there are points met with in our autopsies which differ materially from those given by these authors.

The specific organism was isolated from cattle by Wilson, of Minnesota, and from sheep by Beebe, of Minnesota, hence there is no doubt as to the causative factor. Numerous outbreaks occur in Minnesota, and undoubtedly in other states, and it is very possible the disease may be confused with anthrax, which it closely resembles. The most virulent outbreaks occur among cattle during the months while animals are on pasture. In sheep the disease, while by no means as prevalent as in cattle, appears frequently enough to cause severe losses to owners.

Two great peculiarities are noticed; first, the extreme virulence of the disease for a short time. Ten or twenty per cent. of the herd will die perhaps within twenty-four hours, with no further loss, although animals may be kept in the same pasture and under similar conditions. The second peculiarity is that outbreaks are far removed from each other, with no history or possibility of exposure, and no recurrence of the disease on the premises. Outbreaks are seen on high, sandy land, as well as in low lands. Some are of the opinion that outbreaks are more frequent on the higher sandy lands. Weather and pasture conditions seem to have no bearing upon outbreaks.

Symptoms of the acute form in mature animals are that it is usually ushered in by a general dullness, temperature about normal, cessation of appetite, rumination and milk secretion, bloody diarrhea, and sometimes a frothy, pinkish discharge from nos-

* Read before the sixteenth annual meeting of the U. S. Live Stock Sanitary Association, Chicago, December, 1912.

trils. In the chronic form usually met with in the late winter months, especially when cattle are poorly kept, we find that about the only symptoms exhibited are the cessation of appetite and a paralysis of the hind extremities.

In young animals the acute type is manifested by totally different symptoms. In these cases we have animals staggering, running into objects, bawling as with fright, falling over, legs drawn up to body, and eyes rolling in the sockets.

Sheep.—In these animals we have had occasion to see but three outbreaks, each, however, being of the acute type—animals dying within twenty-four hours after first noticed. As a rule there is a slight mucous discharge, accelerated respiration and marked dullness.

Autopsies.—Hemorrhages in all the serous and mucous membranes. Hemorrhages are seen in the subcutaneous tissue and between the muscles in various parts of the body.

In cattle there is frequently seen a gelatinous infiltration under the skin. The spleen, especially in sheep, is seen to have large, wine colored areas. In other cases the hemorrhagic areas are much smaller. The condition of the spleen in cases coming under our notice is at marked variance with the findings of Hutyra and Marek, who state "the spleen preserves a normal appearance."

Treatment.—Nothing in the way of treatment can be suggested, owing to the rapid course of the disease. A recent article on the "Treatment of Rinderpest and Hemorrhagic Septicemia with Permanganate of Potash," by Major C. K. Walker, of the Indian Civil Veterinary Department, published in the September issue of the *Journal of Comparative Pathology and Therapeutics,* says the result of this drug in the treatment of hemorrhagic septicemia seems to be hopeful.

The ordinary dose for medium-sized cattle may be stated to be 2 drams, and calves may receive ½ to 1 dram.

It is evident from the table that accompanies the article that the cases met with in India are more of the chronic type, as most of the cases quoted are from two to five days in duration, while the cases met with in Minnesota result in death in an exceedingly

short time, making it extremely doubtful if even intravenous injection of this drug would accomplish very much.

As to control measures, it is obvious no restrictions on infected farms can be put into operation, as the disease does not spread, and after attacking a certain number of animals no further loss is experienced, nor has the disease continued on the premises.

NINTH ANNUAL REPORT MINNESOTA LIVE STOCK SANITARY BOARD.—With the compliments of Dr. S. H. Ward, secretary and executive officer, we have received the above-named report for the year ending July 31, 1912, neatly bound in cloth, wine color, with gold lettering, and containing a concise and comprehensive report of the Minnesota live stock sanitary work, covering tuberculosis, glanders, rabies, hemorrhagic septicæmia, anthrax, blackleg, contagious conjunctivitis, malignant and catarrhal fever of cattle, corn-stalk disease, cerebro-spinal meningitis, etc., etc. Two very important and useful features of this little brochure are the "*Directory of Minnesota Breeders of Pure-Bred Cattle, Whose Herds Have Been Tuberculin Tested Under Direction of the Live Stock Sanitary Board*" and the "*Requirements of States Covering the Importation of Live Stock.*"

HOLIDAY EDITION 1912, BREEDER'S GAZETTE received, and we are impressed with its beauty and its high quality. The front cover page is graced by a beautiful head of a draft horse, and the supplement water-color, entitled "Imposing on Good Nature," is pretty enough to be hung upon the wall of any room. In addition there are many interesting illustrations distributed throughout the number, and following Mr. Alvin H. Sanders' "*In Hoc Signo Vinces,*" there are a great number of articles of more than ordinary interest from the pens of prominent men. Among others of especial interest to veterinarians is one entitled "Motor Trucks Supplementing But Not Supplanting Draft Horses," by James E. Poole, and another entitled "Scientific Shoeing of the Draft Horse," by Prof. Joseph Hughes, M.R.C.V.S., of the Chicago Veterinary College. Altogether it is a very excellent number.

REPORTS OF CASES.

INFECTIOUS ABORTION IN SWINE.

By M. H. Reynolds, St. Paul, Minn.

So far as reports in current American veterinary literature are concerned, this must be a very rare disease among American swine. The writer does not remember of seeing any mention of it in our current literature. Standard works on veterinary practice merely mention it casually as a possibility. This outbreak is being reported for the purpose of giving it permanent record and in the hope that it may lead to the collection of further information concerning its prevalence and the possible seriousness of this disease.

Before giving the details concerning this outbreak, it should be explained that this occurred on a well-managed stock farm. The farm superintendent is an unusually careful, capable man, a graduate of an agricultural college, and thoroughly practical.

Under date of April 20 I received a letter from one of our agricultural college graduates, an experienced farmer and a very intelligent man, inquiring as to whether there was such a thing as infectious abortion among swine. From this letter, subsequent correspondence and personal conversation, the following has been gathered and verified:

Farm A—Eleven brood sows were involved; six between one and two years of age and five yearlings. The boar was put with them on December 15, 1911. The sows were fed bundle corn with ordinary table refuse, but no dish-water. They had some potatoes, with a limited amount of bran and ground feed, with continuous access to a mixture of wood-ashes, sulphur and salt. Two or three weeks before farrowing time the sows were separated. Each one was given an individual pen. The feed was changed to a slop of milk, water, bran, ground oats and corn. One week after this separation, the first sow farrowed eleven pigs, all alive, fat, in good condition, but premature. They were small, without hair, estimated from two to three weeks premature

in birth. They all died soon after birth. The pigs were buried, and the sow was isolated.

Sow No. 2 farrowed three days later 11 pigs, apparently at about normal term, all alive; all saved.

Sow No. 3 farrowed the same day in pen next to sow No. 1. She had 13 pigs, about normal size, but without hair. Eight died at birth, 5 living. These sows, by the way, all are pure Duroc-Jerseys and dark red in color. The premature pigs were all without hair and the skin pure white.

Sow No. 4 farrowed three days later than the preceding, twelve pigs: three born dead, 9 alive, but died soon after birth. This sow was next to a sow in pen No. 2. The sow died soon after farrowing. Examination post mortem showed one very small pig about the size of a rat, evidently dead for some time, and one other dead unborn pig that was, as the superintendent described it, "turned in the womb, preventing birth." Sow's bladder was ruptured.

Sow No. 5 farrowed the same day as sow No. 4, in pen next to No. 3. Nine pigs, all alive, but died immediately after birth. Pigs small, without hair, evidently a few weeks premature.

These sows were in good breeding condition, not excessively fat. There does not appear anything in the feed, care or surroundings of this herd in any way to account for the trouble, with the exception that the pens are floored with lumber from the floor of an old cow stable, but investigation indicates that there had never been, so far as known, any abortion among the cows kept in the stables. The hog pens had never been previously used for hogs. I immediately wrote to the superintendent (a personal friend), calling attention to the possibility of serious importance in the trouble among his swine, and suggested that, if possible, precaution be taken to avoid dissemination, in addition to some advice for the local management of this individual herd.

We were not able to secure any material for laboratory work on account of time that had elapsed between the last losses and the first report to us.

Under date of May 16 I received another communication from the superintendent, Mr. D., from which this further information was secured. *Sow No. 6* had farrowed since the previous report with about the same results. She gave birth to 14 pigs, all alive, without hair, evidently premature. All died within a few hours, except two. This sow was two years old and the mother of the other five sows.

Mr. D., foreman Farm A, reported on September 6 that two of the first five aborting sows had recently farrowed full litters, all normal. Sows and pigs doing well. These sows farrowed August 24 and August 29.

The boar used in this herd was purchased in the southern part of the state from a farmer who had raised him. He was farrowed in the spring of 1911, and therefore something less than a year old at the time the sows were bred. The farmer from whom the boar was purchased reports that he had never had abortion among either his hogs or cattle and had brought no outside hogs onto the farm for two years, excepting one young boar which he bought from the Farm A, whereon the five sows aborted; *i. e.*, the two farmers practically exchanged boars. Under date of July 16, the superintendent of Farm A stated that a sow belonging to a neighbor, who used the boar belonging to Farm A, farrowed on July 14 six pigs, all mature and normal in every way. On July 15 another sow, bred to the same boar by this neighbor, farrowed, with everything normal and right. July 15 another sow farrowed for this neighbor. Pigs sired by boar in question. Everything normal. Note that these sows belonging to the neighbor were bred after the Farm A sows were in pig and before any of them had aborted. The infection in this case does not seem to have been transmitted by the boar. The superintendent of Farm A has been unable to get any information, giving a reasonable suspicion of abortion among cattle on this farm where he is now superintendent. The superintendent reports in this communication of May 16 that a neighbor owning eight brood sows had had the misfortune of abortion in one of the sows, which farrowed about twelve days before normal term. The pigs were similar to those as described: small and without hair. The superintendent, having an experimental turn of mind, has bred two aborting sows to the same boar which served them last December, with a view to watching results. Of 68 pigs farrowing by the six sows, only 17 were living at the time of the report.

We are promised material for laboratory and inoculation work, in case of trouble occurring again at the next farrowing time. It is unfortunate, of course, that we were unable to secure materials for such work from the outbreak which I have reported.

A careful study of feed, feeding, methods and surroundings, type of hogs, climatic conditions and general management does not appear to give any reasonable ground for suspecting that these abortions were sporadic rather than of the infectious type.

TREATMENT OF CHOKE IN THE HORSE.

By Horace Bradley, D.V.M., Windsor, Mo.

Choking in an animal always frightens the owner and causes him to seek assistance without delay, and he urges a prompt, quick call. While the veterinarian, unless armed with something different for treatment than that laid down in the text-books, periodicals and journals, will delay making the call as long as possible, in the hope that the horse will be relieved before he arrives.

During my early practice, cases of choke in the horse were the one great dread of my practice, but fortunately a large percentage have been relieved by nature before my arrival. These cases are usually rightly diagnosed by the owner or attendant, and the accident is generally understood as to the causes, the location of the obstruction, physiological and anatomical construction of the organs involved, so it is my intention only to give to you a remedy that I have discovered that will dislodge the obstruction and make these cases desirable. I say I discovered this, for I have never heard of it being used by anyone, and studied it out myself. The old lines of treatment, such as running the animal and jumping him over fences and drenching with oils, etc., are dangerous. The use of the probang does not always dislodge the obstruction, and, no matter how cautiously used, frequently injures the tissues and later proves fatal.

The operation of passing the stomach tube down to the obstruction, cutting down onto the esophagus and tying a cord tight around the esophagus anterior to the obstruction and forcing a water pressure on the obstruction, as advocated by some inventors of stomach tubes, would not meet with the approval of the owner of a valuable horse, even if it was good surgery.

Dr. J. A. McCrank's method, as given in an article in the December, 1910, Review, of placing the patient in a box stall, away from noise and visitors, with a bucket of water in the manger and leave him to the mercy of nature, would hardly satisfy the owner, and be service for which he would be pleased to pay a reasonable fee.

I have seen eserine recommended, but have never tried it. The drug that I use for choke in the horse is apomorphine hydrochloride. The smallness of the dose gives this drug the advantage of being inexpensive, and it is free from irritating properties and may be used hypodermically. The subcutaneous dose is ½ to ¾ grain. Its action is expectorant, sedative, and produces relaxa-

tion and increase of secretion. Following are some cases in illustration:

Case 1: Subject small, branded western mare, ten miles in country and at night. At that time Dr. R. L. Allen and I were partners and made this call together. It was in the fall, and she was running on short pasture and being fed green fodder in the evening. In her ravenousness, she had undertaken to swallow a small nubbin, husk and all, without chewing it, which lodged in the cervical region of the esophagus and could be felt by manipulation. She had not been educated above her western disposition, and objected very seriously to manipulation, and when we placed the mouth speculum on her, preparatory to passing the probang, she became furious and whipped us all out of the yard. This was an opportunity for me to try my new remedy, and I told Dr. Allen if he would tell my wife that I had died brave, that I would venture to give a hypodermic injection of twelve 1/20-grain tablets of apomorphine. Just 13 minutes after the injection she was relieved and ate corn blades.

Case 2: Small, aged, emaciated pony, with very few teeth, brought to my place at 8 o'clock in the morning. When I saw him coming, frothing at the nostrils, head lowered, ears drooped, dejected appearance and staggering gait, I thought I had a case of rupture of the stomach. After examining the pulse, I changed my opinion and, on inquiring into the case, learned that on account of the absence of teeth to properly masticate hard food, that he was being fed on roasting ears, and that he would just break these up and swallow them in large pieces. For the evening feed the day before he had been fed twelve ears and had gotten away with only about one-half of them, which indicated that he had been in this condition all night. I passed the probang and came onto an obstacle in the thoracic region which could not be dislodged with safety. I then gave thirteen 1/20-grain tablets of apomorphine, and in thirteen minutes he was eating grass.

Case 3: 1,200-pound aged mare, while being worked gathering corn, had swallowed a large husk, which lodged in the lower third of the cervical region. A ¾-grain dose of apomorphine, hypodermically, brought relief in a few minutes. The owner remarked: "By George, I never would have thought of unchoking a horse in that way!"

Case 4: Average-sized, aged mare. Had been choking three days. Apomorphine, ¾ grain, was injected, and one hour after

drank one gallon of water and ate some corn. Ate some the following day, but died three days later. The owner posted this case and found that the foreign body had passed on into the stomach, and inflammation had set up where it had been lodged, which caused death.

Case 5: Large three-year-old jack, supposed to be choked on cob; ¾-grain apomorphine given. Was able to eat in a short time.

VALIDOL—SOME INDICATIONS FOR ITS USE.

(Valerianic Acid Menthylester, $C_{10}H_{19}O.CO.C_4H_9$ + 30% $C_{10}H_{19}OH$.)

By Walter Lincoln Bell, D.V.S., Brooklyn, N. Y.

Chemical and Physical Properties.—Validol is a menthylester of valerianic acid with 30 per cent. of free menthol. It is a colorless, crystal-clear liquid of the consistency of glycerine, having a refreshingly cool and very faintly bitter taste. Its odor is mild and pleasant, distinct from either that of valerian or menthol. It is decomposed by alkalies, insoluble in water, readily soluble in alcohol, chloroform, ether or oils.

Pharmacological Character.—The product is a non-poisonous, non-irritant and perfectly harmless analeptic, antihysteric, carminative and stomachic, possessing the therapeutic properties of its two components to a marked degree. Being entirely free from the nauseating odor of valerian and the irritating acridness of menthol, it is well tolerated by the most sensitive patient. It forms an excellent vehicle for additional quantities of menthol, rendering possible the administration of this most valuable analeptic in very large doses and in a most pleasant form.

Some two years ago this preparation was brought to my attention and I have carried out a careful and thorough trial of same and have adopted it in an extensive practice, specializing in the treatment of smaller animals, and have found the therapeutic indications to be; first, as a restorative in conditions caused by shock of any kind; second, as a gastric sedative in vomiting or acute gastritis, and third, in debility consequent upon canine distemper.

Here it is also of undoubted value owing to the mentholic effect upon the intestinal tract, where this condition (distemper) undoubtedly first manifests itself. This, as well as the sedative action of the valerianic acid upon the central nervous system,

places validol in the first rank as a therapeutic agent, especially in those extremely highly nervous breeds of dogs, in which chorea so frequently follows distemper.

Another class of cases in which validol is of essential use is those forms of rheumatism we are so frequently called upon to treat in pets that are much confined to the house. In these cases the local use is indicated as well as the internal administration, and I have found it particularly efficacious in rheumatisms of the cat.

I append two of the cases in which I have secured very successful results with validol:

Case 1.—Bull terrier, nine years old, had always enjoyed good health and was in condition until 1910, when the bowels became impacted by reason of the non-digestion of a chop bone which was carried to near anal end of rectum, where it became lodged. This condition had undoubtedly persisted for some days when I saw animal, as the odor from the mass indicated. I broke it down with force of water from a fountain syringe (well raised above body height) and blunt curette. There was naturally extreme nausea present and much auto-intoxication. These conditions were very successfully combated with five drops validol in capsule every four hours for eighteen hours, after which time vomition was controlled, general condition much improved and above dose was continued three times daily for several days.

This same dog later had several attacks of "lumbago" and these were shortly terminated with same dose of validol every four hours until acute symptoms abated, after which it was given three times daily for several days. A small amount was also rubbed in over lumbar muscles twice daily and undoubtedly rendered good service.

Case 2.—Persian cat, adult, had litter of kittens six weeks previous; about this time developed a very acute general rheumatic condition, particularly affecting the lumbar region and causing complete inability to walk or even crawl. Much pain when moved, bowels torpid, feverish. *Treatment:* Aloin grains one-twelfth every hour for six doses, when bowels showed sufficient effect, and from start the cat was given three drops of validol in capsule every four hours, followed by small amount of sugar and water solution each time; small amount of equal parts validol and olive oil rubbed in over lumbar region twice daily, and the animal made a very satisfactory recovery.

Dosage.—Internally, two to fifteen drops, according to age and breed of animal; best given in a little sugar-water or capsule

followed by some dilutant, repeated as necessary. Externally, as an inhalant or diluted with equal parts olive oil and rubbed in indicated places.

RARE CASE OF DYSTOKIA IN THE MARE.

By D. J. Meador, B.S., D.V.M., Selma, Ala.

March 22, 1912, I was called to attend a case of dystokia in a bay mare weighing about 1,000 pounds.

On arriving I found the mare down in a cotton field. She had been working at the plow and was taken out on showing signs of the approaching parturition.

The owner informed me that the mare had been in labor for about two hours. She was in extreme pain, and being much exhausted, her expulsive efforts, while quite frequent, were very weak in force.

After being told that no attempt had been made to remove the fœtus I at once made examination. This revealed an anterior presentation with dorsosacral position. Both forefeet were in the vagina. A right lateral deviation of the head and neck were the cause of the dystokia. It was observed to my surprise that a live fœtus was being dealt with.

As quickly as possible preparations were made for a delivery. The mare being in lateral recumbency on her right side, it was not necessary to change her position.

A cord was passed over both forefeet and the entire fœtus repulsed. This allowed the head and neck to come within reach. The mouth of the fœtus was grasped and the head and neck placed in proper position. Traction was now applied to the cord, while the hand guided the head and a quick delivery was effected.

The foal was indeed a very weak one and special effort was used to keep up respiration. The foal was dried and placed on a blanket, and the mare was given strychnine subcutaneously.

The fœtal membranes did not pass out with the foal and were found to be so firmly adhered to the uterine walls that it was decided to remove them later.

The owner was instructed to let me know if the mare was unable to rise after an hour or two. I heard nothing, however, and the next morning on arriving at the farm I found that the mare had cast her membranes and was being followed by a fine colt.

It seems that the preservation of the life of this foal is to be accounted for by the membranes remaining intact, thus insuring nourishment while the mare was in labor, and by the fact that no forced extraction or crude methods had been attempted.

FILARIA IMMITIS IN THE DOG.

By W. H. Dalrymple, M.R.C.V.S., Baton Rouge, La.

The accompanying photograph illustrates the presence of the *Filaria immitis* in the heart of an aged pointer bitch, in the practice of Dr. E. Pegrim Flower, of Baton Rouge. Definite history

and particulars in relation to the case cannot be given, beyond the fact that the animal was in a dropsical condition, as it occurred many years ago, but thought the photograph sufficiently good to be worthy of reproduction in the Review.

A PECULIAR CASE.

By J. V. Hills, D.V.M., Gowanda, N. Y.

An aged bay gelding, affected with heaves, had been unable to swallow water or eat anything for 24 hours, when the writer

was called. Temperature and respiration were normal, and the animal constantly attempted to eat and drink, but with no success. Examination of mouth and throat with speculum revealed nothing. Neither was there any soreness or swelling anywhere. I passed a rubber hose down his oesophagus easily; and as he had not drunk for 20 hours, I pumped two large pails of water into him through the hose with the injection pump, adding a little castor oil to the water. After withdrawing the hose I gave the horse ½ grain strychnine sulph. hypodermically, and prescribed mild liniment to be rubbed on the throat, informing the owner that I considered it nearly a hopeless case, and advised that if he was no better by the next day to destroy him, as, in addition to everything else, his age and the heaves were against him. This was in July.

A month later I saw this horse and his mate hauling a load of gravel, and then learned the following from the owner: He told me he would not swallow anything, but he had poured milk and water into him for two days, when he went down and could not get up. He kept pouring water and milk into him, and put a poultice on his throat. It was 10 days before he could get up again, when he recovered quite rapidly and was soon able to eat again. The owner censured me for advising him to kill the animal, saying the trouble was sore throat, which I told him emphatically was not the case. I am stating this as near to the facts as I can learn them from my observations and from the owner; and if anyone has had a similar experience, kindly answer through the REVIEW. The horse has not had another attack since.

INDIANA STATE BOARD OF VETERINARY MEDICAL EXAMINERS holds its next meeting at the State House, on Tuesday, January 14, 1913. Candidates may obtain particulars by addressing Dr. O. L. Boor, secretary, Muncie, Ind.

DR. WARREN L. THAYER MARRIED.—On December 7, 1912, Dr. Warren L. Thayer, class of 1897, McGill, was joined in wedlock with Miss Minnie E. Munson, of Worcester, Mass., where the happy couple will reside after their return from a short trip to the South. The REVIEW invokes its blessing.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Multiple Vesical Calculi in Dog [*Henry Taylor, F.R.C.V.S.*].—Retriever dog exhibited all the symptoms of blocking of the urethra by urinary calculus. He is operated, and with the mischievous stone, eight others, smaller, are removed. The dog does well for about ten days, although his urine is a little tinged with blood. He has another obstruction, is operated a second time and thirty more calculi came away with the first rush of urine. The animal does not seem to do well and the owner had him destroyed. The postmortem revealed the fact that the spleen contained several lympho-sarcomatous tumors, the kidneys were cirrhotic, the bladder contained ninety more calculi, besides a quantity of sabulous matter like gravel. Several calculi were embedded in the mucosa. The subcutaneous tissues in the region of the operation were sodden and green as if the urine had infiltrated and had a decomposing action.—(*Vet. Record.*)

Unusual Abscess in Abdominal Wall [*By the same*].—Filly is found one morning with pus oozing from what appeared to be a small abscess in the muscles of the flank just inferior to right stifle. As no improvement takes place under ordinary treatment, and as by probing a tract running downward under the skin was detected, a seton was introduced after making a dependent opening. No improvement, discharge remains the same. As the trouble exists since over six weeks, the mare is cast, the tract fully incised in its whole length and the tissues underlying being found much discolored and unhealthy, black and infiltrated, necrotic in fact, they are all excised, leaving but a very delicate thin layer for the abdominal wall. Fearing its possible rupture, as the animal would rise, much care was applied to guard against it. Recovery was looked for after this, but white granulations had developed and complete cicatrization apparent, there remained for weeks after, a small sinus and discharge. The animal being cast again, the cicatrizing wound was carefully examined and finally a probe was inserted into a fine tract, which required a minute dissection before the knife penetrated into the

cavity of an abscess, situated on the inside of the abdominal wall and was about the size of an orange. The entrance to the cavity was enlarged, drainage established and disinfecting dressing with lysol or izal completed an uneventful recovery. It is unusual to find an abscess so deeply situated. The filly never had strangles.—(*Veter. Record.*)

A Case of Lameness [*Capt. W. H. Taylor, A.V.C.*].—Eight years old past, this bay gelding becomes lame—there is no history previous to it. The trouble is located on the off fore leg with slight enlargement of the pastern joint. Treatment is applied without benefit to the patient and the lameness becomes so severe that it was decided to kill the gelding. At the post-mortem examination the articular surfaces of the pastern joint were found extensively diseased, with a piece of bone, the size of a haricot bean, being almost loose by an ulcerative process. The os corona had an ulcer corresponding to it. In boiling the bone the small piece fell off from the principal part of the suffraginis, on the lower third of which was a well developed exostosis.—(*Vet. News.*)

Dilatation of the Stomach—Duodenal Ulcer [*E. Wallis Hoare, F.R.C.V.S.*].—Gray cart gelding, with exception of two attacks of colic, has been in perfect health. One morning he is found shivering, has slight salivation, respiration accelerated, frequent efforts to micturate, lays down and has some difficulty to rise. Visible mucosa are pale, pulse quick, temperature normal. Flatus at intervals. Later on, he has eructations and oesophagal regurgitation; few grains of oats are in the nasal discharge—then he has a haggard expression of countenance, tympanitis and the pulse is almost imperceptible. Terebene and linseed oil are given. Animal is much distressed, groans, lays, struggles and dies. Postmortem shows stomach much enlarged and looking like the rumen of an ox. There is only moderate amount of gas, but enormous amount of fluid. In the duodenum a well-marked ulcer is found extending to the peritoneal coat and surrounding the opening of the bile duct.—(*Vet. Record.*)

Volvulus of the Ileum [*By the same*].—First, aged gelding after a day of slow work is taken home in evening and eats his food. Next morning he is found in pain, much marked about head and quarters. He receives a cold drench. He soon has a haggard expression, sunken eyes, sweating, abdomen hard, tym-

panitis, looked toward the flank. He has no violent colics and passes small quantity of hard feces. Chloroform gives a little relief but this is only temporary and death takes place in the evening. *Autopsy*—Abdomen much distended. Volvulus at the termination of the ileum with 14 feet of the intestine much inflamed and distended with foetid blood. Stomach full of ingesta. Second, another aged gelding, while at work is taken with violent pains and sat on his haunches for long periods. He lies down, attempts to roll and then sit on his haunches. The position seems to give him the most relief. Chloral brought some relief and was given at intervals. Death took place after several hours of suffering.

Postmortem.—Intricate twist was found in the ileum toward the distal end. It resembled a double knot and could not be disentangled even after removal from the body.—(*Ibid.*)

Pulmonary Helminthiasis in the Ass [*A. W. Noel Pilters, F.R.C.V.S.*].—This history of the patient, a yearling donkey, was that it had been bought about three months before and had gradually lost flesh. Frequent attacks of violent coughing with expulsion of frothy material from the nose were also noticed. After an illness of two months he died. *Postmortem*—Several worms were found protruding from both nostrils, 200 specimens were in the turbinated bones, many were also in the passages leading to the posterior nares. The larynx was crowded but the trachea contained only four worms. At the bifurcation of the bronchi the parasites were so numerous as to blockade the lumen almost entirely. Sections of the lungs showed the presence of worms. There was one in the oesophagus and two in the stomach. Fero strongylus vulgaris were in the small colon. Under microscopic examination of the lungs many ova of strongylus and immatured forms were exposed.—(*Vet. Record.*)

Hydrochloride of Urea and Quinine as Local Anesthetic in Veterinary Practice [*Prof. Geo. H. Wooldridge, F.R.C.V.S.*].—The author records four cases to illustrate its usefulness; in one, for the amputation of the dew claws of a fox terrier, in two others for the removal of large mammary tumor and in the fourth for shoulder tumors in a horse. The operations were successful, and the professor writes as conclusions: "It will thus be seen that hydrochloride of urea and quinine is quite an efficient local anesthetic in the strength of 1 per cent. to ½ per cent. Its action, however, appears to be very limited in

extent, and does not spread far from the seat of injection. It does not appear to possess any hemostatic action, but can be effectively used in combination with renastyptin or other suprarenal preparation. Compared with cocaine it is less toxic and much cheaper. It is slower in action; an interval of at least half an hour should be allowed between injection and incision, but its action is more durable. In fact, it has been claimed that some anodyne effect persists for several days."—(*Vet. Journ.*)

Intestinal Sarcoma and Endocarditis in a Horse [*W. Lothian, M.R.C.V.S.*]—Thoroughbred mare, always in good health and good worker, is turned out after hunting season. She is observed dull one morning and on examination her heart seems to be the chief seat of the trouble. Cardiac tonic and stimulants were prescribed, but the mare died two days later. Postmortem revealed croupous peritonitis and "along the large intestine a number of large lumps in the bowel substance about the size of one's fist and most numerous about the diaphragmatic flexure of the colon." These were round-celled sarcoma. The heart showed a small warty growth affecting the right tricuspid valve, different in character from the bowels.—(*Vet. Journ.*)

Diffuse Lipomatosis in a Mule [*Capt. H. A. Stewart, M.R.C.V.S., A.V.C.*].—Mule has a weak thready pulse, respirations about normal, temperature 102° F. anorexia, slight diarrhœa and inclination to lie down. She braces up some under treatment for short time, and dies without a struggle. *Postmortem.*—Abdominal organs are covered with modulated fatty masses, between the folds of the mesentery there is a fatty tumor weighing 40 to 45 pounds. The liver was in chronic venous congestion and had several small lipomata on its surface. Antemortem clot was found in the left auriculo-ventricular opening.—(*Ibid.*)

Gastrotomy with Removal of a Ball [*Prof. Fred. Hobday, F.R.C.V.S.*].—Eighteen-months well-bred bulldog swallows a rubber ball. He has vomiting, principally after taking food or after any excitement. Radiography is applied to confirm the condition of his stomach and the result was the demonstration beyond all possibility of doubt of the presence of the ball in his stomach. Laparotomy was performed and recovery perfect. The diet was carefully carried out; no food per mouth for four days, rectal meat suppositories every four hours, teaspoonful of water

at same intervals. On the fifth day bovinine was allowed three times a day and kept up with gradual increase. Then Brand's essence of beef. Meat was allowed only after the eighth day.—(*Ibid.*)

FRENCH REVIEW.

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

Early Attendance in Three Cases of Severe Traumatism [*Mr. Bonnigal*].—*First*—Horse receives with an iron skiver a big laceration of the skin, on the median line of the abdomen, 15 centimeters from the xyphoid sternal cartilage. Attended to four hours after the accident. The abdominal walls are perforated, three fingers can be introduced in the abdomen and the sternal curvature of the colon is felt by them. Antiseptic treatment with tincture of iodine, pressure made by the skin, tight bandage over. Dressing with iodine renewed daily. No bad reaction, moderate suppuration, recovery in two weeks.

Second—Seen two hours and half after receiving the injury. The horse has dropped on the handle of a fork which, penetrated into the sheath, broke in two pieces, one probed its way near the anus and is pulled out that way, the other part of the handle drawn through the sheath. The tract between the two orifices cannot be traced with probes. Antiseptic injection reveals its presence. One injection of iodine is made and followed after, three times a day, with cresyled solution. Scarcely any reaction, little pus, convalescence on the fifth day.

Third—Heavy draught horse, gets a deep punctured and lacerated wound of the croup. The entrance is near to the coxo-femoral joint. It runs so that the sacrosciatic ligament is run through. Feces can be felt in the rectum, which seems unharmed. The wound is plugged with gauze dipped in antiseptic solution of iodine. The dressing is renewed for five days and continued with cresyled injections. On the sixth day defecation and micturition are getting painful. Rectal examination revealed the presence of a purulent collection which is squeezed out by the healing surface of the wound. Treatment is kept up. Discharge continues for four months and finally recovery followed. This case was seen an hour after the accident. Conclusion of the author: with attendance applied early, one may hope for success in cases even that are most dangerous in appearance.—(*Presse Veter.*)

Toxicity of Pulverized Boric Acid as External Dressing [*Mr. Charmoy, Adjunct Professor*].—In September, 1906, there appeared a very important recommendation of the safe use of pulverized boric acid in the treatment of wounds, to which the Review alluded in a later Chronicle.

Professor Charmoy has tested the value of the same treatment and in several articles where he reviewed the subject he gives the record of his observations carried as experiments in eight cases where the results were entirely different and, of course, his conclusions not in accordance with those previously mentioned. Applied in dogs, the professor states: "1. Boric acid in powder, used in dogs, as external application on wounds is toxic at a dose varying between 2 gr. 5 and 3 gram. for each kilogram of the animal, when he is in satisfactory condition of health.

"2. The toxicity is much greater with animals already affected with chronic disease, especially nephritis or skin affection.

"3. The symptoms of the intoxication, though varying in animals and according to the dose, are characterized at the start by dullness, difficulty of locomotion, slight acceleration of the great functions; afterward by vomiting, diarrhœa and lowering of the temperature; at the end by complete muscular resolution, sometimes blood in the feces or vomits and by albuminuria. Death occurs in hypothermy and coma.

"4. Death seems due to the rapid evolution of acute nephritis and nervo-muscular paralysis."

Boric acid in powder is not a harmless drug and at no matter in what dose its use ought not to be generalized.—(*Rec. de Med. Vet.*)

Peritonitis By Traumatic Suppuration of the Gluteal Region [*Mr. Augustin, Army Veterinarian*].—Ten-year-old horse, harnessed to iron ploughing machine, runs away, falls and two teeth of the instrument enter in the gluteal and posterior crural region, making wounds 15 centimeters deep. The wounds are irregular, bleeding abundantly; their edges are ragged. A free incision unites the two tracts and a proper treatment prescribed. A very severe reaction takes place, enormous swelling is found and abundant suppuration follows. The traumatic fever is intense and lasted eight days, after which it subsided. The condition of the animal is bad and he is found dead in the morning. The post mortem revealed lesions of very acute pelvi-peritonitis, with two litres of fluid in the peritoneum. The dissection

of the wounded region exposes two tracts, one running through the mass of the semi-tendinosus and biceps femoris muscles to reach behind the femoro-tibial joint. The other passing upward, back of the coxo-femoral articulation through the small gluteus and entering the pelvis through the great sciatic notch, where it infected the parietal sheath of the pelvic peritoneum.—(*Rev. Gen. de Med. Vet.*)

Osteomas of the Dura Mater [*Dr. Marchard and Prof. G. Petit*].—In a communication made by the professor some time ago on the pathogeny of ossifying spinal pachymeningitis of dog he concluded in saying that:

1. The pathogeny of osteoma of the dura mater in threads or in plates like that of most osteomas in general is unknown.

2. Contrary to the classical opinion, those osteomas which result from a slow and altogether metaphysical transformation of the fibrous tissue do not correspond at all to a pachymeningitis.

3. Again contrary to what has always been said they do not, in the immense majority of cases, have any morbid action whatsoever.

As evidence, a case is reported of a dog affected with paresis of the hind legs by myelomalacia of vascular origin where osteomas of the dura mater were detected at the post mortem. The dog had only a slight paralysis of the hind legs, and presented on the dura mater osseous plates, principally abundant in the lumbar region. They had no part in the pathogeny of the nervous troubles which were due to lesions of the spinal cord, where centers of myelomalacia, degeneration of softening were detected by lesions of the blood vessels.—(*Bullet. de la Soc. Cent.*)

Two Cases of Immobility [*MM. Rousseau and Chicou*].—Immobility is often diagnosed only at the last stage of the disease. The authors suggest that a diagnosis could be made before by close attention and by the peculiar history of the case. From the two cases recorded it appears that the characters of the two animals pointed out at prodromes of the final ailment. They are considering that ugly horses, those that have a tendency to run away, that are nervous, irritable or even those that have the habit of pulling backward when tied up in their stall, all are subjects which may prove in the end to become immobile.

At the post mortem of the two cases reported one had an abscess of the dura mater and two globular neoplasms in the lateral ventricles developed in the choroid plexuses; they were

cholesteatomas of the cerebral choroid plexuses. In the other horse the pia mater was hyperemic, and the cerebral ventricles somewhat dilated, contained 25 c.c. of arachnoid fluid.—(*Rev. Veter. Milit.*)

INTESTINAL OBSTRUCTION—CECAL CALCULUS—RUPTURED ANEURISM OF THE INFERIOR CECAL ARTERY [*Mr. Magnier*].—Nine-year-old mare has had several attacks of chronic enteritis. One day she is sick again, has intermittent colics which disappear rapidly. She has them for one week and shows symptoms of intestinal obstruction. Treated, she improves and then has another attack more severe, and finally dies with evident intestinal hemorrhage.

Post Mortem—Cecum black and ecchymotic, has a ruptured aneurism at the origin of the inferior cecal artery; in the cavity of the cecum there is a bezoard calculus weighing 2 kilog. 450 gram.; the large and floating colon showed lesions of chronic enteritis.

During life the mare assumed the dog or sphinx laying down position, she gaps repeatedly and almost continuously; when she was to be mounted by her rider she tried to bite him and moaned when he sat in the saddle, she could not gallop on the right, toward the last of her life she always laid on the left side.—(*R. Veter. Mil.*)

DR. G. A. KAY, B. A. I. SERVICE, has been transferred from South Omaha, Neb., to Lincoln, that state, and made "Inspector in Charge" at his new post. We congratulate the doctor on his promotion.

THE TURKEY BUZZARD AS A CARRIER AND TRANSMITTER OF ANIMAL DISEASES is the title of bulletin No. 71 issued by Dr. George R. White, State Live Stock Inspector of Tennessee, to the farmers of that state.

A FRIEND IN NEED.—An Iowa subscriber writes: "I need the REVIEW in my business, it aids in time of trouble."

CORRESPONDENCE.

HORSES IN THE TROPICS.

FORT WM. MCKINLEY, PIZAL, P. I., November 6, 1912.

Editors AMERICAN VETERINARY REVIEW, *New York:*

Replying to an article which appeared in the August REVIEW, under the heading "Horses in the Tropics," let us search a little deeper than the color of the skin for the cause of nervousness.

The writer unconsciously touches the keynote when he says, "On review the gray horses are actually phlegmatic, the sorrels quiet, the bays excitable and restless, while the blacks are the worst of all."

The reason is plainly not due to the coloring, but to the breeding. Fully 90 per cent. of the grays are grade Percherons, phlegmatic in type, gentle and quiet, and a disposition to take life as easy as his surroundings will permit. This will hold good whether he is in a hot or a cold climate.

A large percentage of the sorrels have a trace of Morgan (the ideal family pet for a *lightweight horse*), quiet and gentle in disposition, though with more life and spirit than the Percheron, yet easily controlled; or from the hackney, who, while high stepping and proud, are easily managed and sensible.

And lastly the browns and blacks, "the most excitable and restless of all."

The reason for this is easily found. With the exception of the heavier horses, which I will speak of later, the majority of the bays and blacks are grades, either from the standard bred or the thoroughbred, the two most vicious, excitable and unmanageable breeds of horses we have to contend with in the army. This temperament of the thoroughbred is well known and conceded by all standard works on horse breeding.

The remaining gray horses (other than the Percherons), used in the army, are largely of Arabian blood. Those foaled in the states are usually from some imported Arabian stallion, and those used in the Philippines come from Australia and are a mixture of Arabian and thoroughbred, or to a lesser extent the native Australian pony.

The well-known high-strung, nervous temperament of the

Arabian and his descendant, the thoroughbred, is too well known among horsemen to require further comment here, and those who breed back to the white color of the Arabian show up as nervous and excitable as do the bays and blacks of equal amount of Arabian blood.

Yet, if the color theory held good, we would find the grays phlegmatic, and the bays and blacks excitable and restless, which is not the case. With but few exceptions (which is bound to occur in all breeds) the horses of one breed, regardless of color, all seem to possess about the same disposition.

Now let us take up the horses of the field artillery. In Batteries "A," "B" and "C," First Field Artillery, for which I am at present attending veterinarian, there are about twenty gray horses in about five hundred, the remainder being bays, browns and blacks.

Now, if this "unknown relation between color and nervousness" held good, we should expect to find the grays phlegmatic, and the bays and blacks excitable and nervous. But here again we would be disappointed, as the bays and blacks are as quiet and sluggish as the grays, thus pointing away from "tropical influence on color" and toward the breeding.

The artillery horse is primarily a draft horse, and he averages from 150 to 250 pounds heavier than the cavalry horse. Consequently his breeding must be different, in order to attain greater weight. We find occasionally a few grade French and German coach horses, while probably one-third are Percheron grades, but the majority are Clydesdales, noted the world over for their gentle disposition, and the effects of the tropics have failed to work any change in them.

Occasionally we get a few Clydesdales in the cavalry when the cross-breeding has produced a horse sufficiently light and active to do cavalry work. These horses are known among the men as "Chubbies." They are short and blocky and of splendid disposition. While not quite so active and quick at drill, they have wonderful staying qualities on hard marches and short rations.

Now, as to the reason for the gray horse living longer in the tropics, we can also include the bays and blacks, who are grades from Percheron or Clydesdale blood.

When the Percheron or Clydesdale starts out for the day's march, he quietly settles into his task with as little outlay of unnecessary energy as possible, and if not reined in too tightly

will try and pick his path, and when halted for rest and readjustment of equipment he immediately begins to search for something to eat. It may be only a few green leaves or weeds, or a bunch of dead grass, but it is astonishing how much it seems to refresh him and keep up his strength.

On the other hand take the grade thoroughbred. The first thing, he proceeds, with varying success, to buck his rider off, throw his pack out of balance and adjustment, which is a sure "saddle-sore getter." In his fight with his rider he is worked into an excited condition, and starts down the road with his forefeet in the road and his hind ones in the ditch, or vice versa, and prances ("jigs," the soldiers call it) till he has expended his last ounce of strength and energy (and also that of his rider), and then he gives out before the march is finished. I have seen horses exhaust themselves in this way and have to drop behind the column and be led the last five or ten miles of march, and then repeat the same process several days in succession.

This is the reason why the gray horses have a longer life than those of the lighter weight breeds, and this same rule will hold good in the northern states, where the tropics are not a deciding factor.

Another reason (among army horses) is this: I have before me the sick records of the Seventh Cavalry horses while at Fort Riley, Kansas. The horses of Troop M were all grays, with the exception of seven or eight, which were blacks. The sick report for the year 1910 showed a total of 90 cases, while Troop G, a bay troop, composed largely of grade thoroughbreds, had a sick report of 166 for the same period. Troop M averaged one new case every four and one-eighteenth days; Troop G averaged one new case every two and one-fifth days. Troop M's average period of sickness per horse was 15 days; Troop G's average period of sickness per horse was 22 days. Giving for Troop M a daily sick report of three and five-sevenths horses; Troop G, a daily sick report of ten horses.

I am submitting these figures to show that the gray horse is less liable to disabilities, regardless of what climate he is in.

Eliminating the saddle-sores from the records of both troops, which were about equal, the percentage of other sicknesses and injuries was still larger in favor of the grays.

The general average of the age of the gray troop was considerably larger than in the bays, and therefore they had had more years of service in which to accumulate chronic saddle-

sores. Even with this handicap, they compared favorably with the bays.

The diseases of the feet, which form no small part of the disabilities of the army horse, are corns, canker, thrush and navicular disease, due largely to the army horse being kept constantly shod all the year. In Troops M and G the percentage of corns were about equal, but, due to the hoofs of the gray horses being slightly larger and more flat, the heels broader, the frog larger and therefore with more frog pressure on the ground, the percentage of canker, thrush and navicular disease was largely in favor of the grays.

The gray horse's feet being flatter, theoretically he would be more predisposed to laminitis when on the hard roads. This was not borne out by experience, however, due, probably, largely to the grade Percheron traveling low, thus avoiding the concussion incident to higher action, and also to his natural disposition to take better care of himself.

The injuries, self-inflicted and those inflicted by their mates, form the greater portion of the sick records, and is largely in favor of the grays. This will not seem strange after observing the horses loose in the corrals.

The gray horse, after his work is finished and he is turned into the corral, will hunt up a bit of rope, a broken halter shank, an old grooming cloth, or some such object, and go away by himself and nibble and play with it for hours, or if the flies are bad, he will hunt up his mate (nearly all horses choose a corral mate), and they will range "alongside," but headed in opposite directions, so each can switch the flies off the neck and shoulders of the other, which each cannot reach with his own tail.

Go to the corral of the bay horses, and instead of resting when they get the opportunity, they are racing back and forth, biting and striking, and as for switching flies, they seem to prefer the use of their teeth and nails. There are more injuries self-inflicted and by their mates than in "line of duty." And there are more injuries to treat at evening stables (provided the horses have been loose in the corral) than after returning from morning drills.

For 1910, Troop M's sick record shows, injured by other horses, 2; Troop G's sick record shows, injured by other horses, 21.

Those injuries are usually severe, are penetrating wounds, and therefore usually deeply infected, and account for the longer average sick period.

I believe that color plays no important part in the long life or the ability to stand the tropics, only insofar as it becomes characteristic of a certain breed, and that the *breeding* and *not* the color is the deciding factor.

From observations I am of the opinion that if we have a cross between a black or brown Percheron stallion and a mare of no special breeding, resulting, as they frequently do, in a roan or a bay, that they will be as quiet and long lived as those bred from the gray stallion.

At the present time there are bay horses in the Seventh Cavalry, now at Fort McKinley, that show Percheron and Clydesdale blood. The records show that those horses came over here from the States with the first expedition mounted. Some of them are over twenty years of age and are still doing duty with their gray brothers that came over at the same time.

I wish to distinctly emphasize the fact that in this article I am not advocating the purchase of any particular type of horse for the army. That is entirely another question. The point for consideration in this article was, What influence, if any, has color on the temperament, stamina and long life of the horse in the tropics?

Very respectfully,

W. C. Van Allstyne, M.D.C., V.S.,
Veterinarian, Seventh Cavalry, Philippine Islands.

IS THE AMERICAN VETERINARY MEDICAL ASSOCIATION A NATIONAL ORGANIZATION IN FACT AS WELL AS IN NAME?

Editors American Veterinary Review, *New York:*

The question we have frequently asked ourselves during the past few years, and more particularly since the close of the Indianapolis meeting, is, "Is the American Veterinary Medical Association a national organization in fact as well as in name, or does it truly and adequately represent in a national capacity the veterinary profession, with its vast membership, on this great continent?"

We would like, with your kind permission and co-operation, to discuss this problem with a view of getting an expression of opinion from your journal and from its readers.

The first phase of this important question, that strikes us most

forcibly, is the comparatively small membership. It would appear in view of the large number of veterinarians in the United States, Canada and our insular possessions, that the percentage of A. V. M. A. members is so small as to be almost insignificant. Does it not seem possible and probable that there is some influence or element at work that is responsible for the anemic condition of our membership roll? Is it not reasonable to ask why it is almost necessary to anesthetize a man before he will affix his name to an application blank? Another question prompts itself to the effect that it would be most interesting to know what the A. V. M. A. has accomplished in the past few years, as a national organization, for the benefit of the veterinary profession and for the public at large.

The constitution of the A. V. M. A. states that the purposes of the association are, to promote good fellowship; to elevate the standards of veterinary education; to cultivate medical science and literature; to enlighten and direct public opinion regarding veterinary problems of state medicine; to protect the medical interests of the veterinary profession and present to the world its achievements.

Have any of these purposes or objects been accomplished, or have they been carried out to the extent anticipated by the founders of the association? Are we to consider it incumbent upon us to carry out these constitutional provisions, or are we to look upon Article II. of the constitution to be in the nature of a bluff? Perhaps some of these provisions have been carried out in part, but what has the national association accomplished more than has been or is being accomplished by any little unpretentious state association composed of half a hundred members?

In discussing some of these problems, we propose to be entirely frank in the premises, hoping to be able to encourage others who, we trust, will avail themselves of your kind offices to enter into the discussion in a similar spirit.

Perhaps the main obstacle which has been and is hampering the progress of the A. V. M. A. is the fact that its affairs are manipulated and controlled by a small coterie of men who, geographically and professionally, represent but a small portion of the American continent. Perhaps we may go farther and venture to say that the national organization is controlled and manipulated by a few men, whose numbers can be estimated upon the fingers of a normal hand. We frankly admit that we are most willing and ready to do homage to any individual or indi-

viduals who are big enough to control a national organization and its policies, even if their views do not harmonize with ours, but at the same time we feel that the methods enlisted in gaining and maintaining such control should be, in the case of the A. V. M. A., carefully analyzed.

The writer, among others, believes that any one who has attended the meetings and has studied the internal workings of the A. V. M. A. must have been struck with the character of the politics pursued by a certain element, in order to control and dominate its policies almost since its inception. To a student of such matters the affairs of the national organization seem to be in the hands of a political trust, who do not hesitate to resort to any kind of tactics to accomplish their objects. In other words, they appear to work on the assumption that the end justifies the means.

If attempts, which have been frequent in the past few years, are made to overcome these conditions, such attempts are frustrated by methods that are despicable and dishonorable, to say the least. If new or young blood is offered for injection into the body politic, for the purpose of stimulation and perhaps rejuvenation, it is attacked by scurrilous innuendos and insinuations to such an extent that a self-respecting aspirant for political honors at the hands of the association is debarred from further participation, as he would naturally prefer to relinquish his candidacy and deny himself such honor rather than be exposed to unrighteous vilification, fostered as a result of intrigue and mendacity on the part of those who oppose for selfish reasons his candidacy. All this goes to show that there is an influence or an element at work that will stop at nothing, no matter how despicable it may be, to gain their ends.

It is believed that those who attended the Indianapolis meeting will agree with us that the manner in which the affairs of the association were administered was not only pathetic, but deplorable. The scene depicted during the evening, when the order of business was the election of officers, had much to recommend it as a prize exhibition of buffoonery. The entire session was an exhibition of improper conduct on the part of the temporary presiding officer, who resorted to or indulged in repartee and parliamentary usage of a very questionable character. The temporary presiding officer on that occasion was presumably acting according to instructions, and it reminded the spectator of nothing so much as steam-roller politics, which would not be out of

place at a political ward gathering, where a slate was the order of the day.

Can we wonder at the standing of the A. V. M. A., when such scenes can be enacted during what is supposed to be a gathering of dignified and scientific men, whose purpose is or should be the advancement and elevation of the profession and the promulgation and dissemination of knowledge for the future benefit of mankind. Can we expect men to travel hundreds or perhaps thousands of miles for scientific enlightenment when such conditions continue to prevail?

When the California delegation reached the Middle West before the Indianapolis meeting, it was approached with a tentative proposition to the effect that the profession on the Pacific Coast be requested to join with the profession in the Middle West to secede from the A. V. M. A. and form another organization, national in character. It is, perhaps, unnecessary to say, the California delegation refused to consider such a movement and stated emphatically that it would stay with the now national organization until the last gun was fired. Furthermore, it stated that it proposed to do everything within its power to make the present A. V. M. A. representative in character and a national organization in fact as well as in name.

One of the reasons given by the profession in the Middle West as an excuse to secede, and one of the main reasons why a division seemed advisable, is to the effect that under the present conditions the West or Middle West has no voice, nor representation as far as the administration of the affairs of the A. V. M. A. is concerned. We believe that the contention of the Middle West is correct, and we feel that those of us from the far West are to some extent in a similar position; at the same time we believe that this entire question resolves itself into one of adjustment of the affairs of the national society, so that every section of the country will have some voice in its administration.

We hold that the reorganization of the national association is the solution of the problem. Let us reorganize upon modern and progressive lines, and let us do away with the antiquated, medieval or obsolete constitution and by-laws that permit a few individuals to dominate and control matters for their own aggrandizement. Let us infuse some new blood and other things that stand for modernity and progress, and let us frown down upon anything and everything that savors of chicanery and iniquity.

Why not, Mr. Editor, reorganize the A. V. M. A. on such a basis that a component society of each state, province or territory would be represented according to its membership, one delegate for every so many members or fraction thereof? Such representatives to form a house of delegates and constitute the administrative body of the association. Thus every section of the country would be represented and be entitled to participate in all business deliberations, and at the same time, which is the most important feature of all, the scientific and literary program of our meetings would not be interfered with by business or politics.

A house of delegates, as suggested above, and a secretary, whose entire time would be devoted to association matters, would mean an enormous increase in our membership and at the same time would have a tendency to cement a union between the various sections of this great continent that could only result in inestimable benefit to the profession in general and the public at large.

The California State Veterinary Medical Association has appointed a standing committee for the purpose of inaugurating a campaign whose ultimate object is to assist in the upbuilding of the A. V. M. A. to the point of efficiency where it must be recognized as one of the most important scientific organizations in existence, and, with a view of stimulating improvement, and reorganization if necessary, the committee, through its chairman, the writer, desires to announce that it is particularly desirous that other state associations will join in such a campaign and attack this problem with it.

R. A. ARCHIBALD,
Chairman Committee on American Veterinary Medical Association Affairs.

A CORRECTION.—As the result of a typographical error the word *goncitis*, fourth word, sixth line, page 310, December REVIEW, occurring in Dr. Cochran's article on "stifle lameness," was spelled gonlitis. The printers mistook the script e for an l, and it was missed in the proofreading.

THE CHRISTMAS NUMBER OF THE FARMER'S ADVOCATE, Winnipeg, has just reached us, and certainly is a credit to its publishers. We regret that it did not reach us while we still had room to express our appreciation of it fully.

BIBLIOGRAPHY.

IMMUNITY.

IMMUNITY—METHODS OF DIAGNOSIS AND THERAPY AND THEIR PRACTICAL APPLICATION, by Dr. Julius Citron, Assistant at the University Clinic of Berlin, Medical Division, translated from the German and edited by A. L. Garbat, M.D., Assistant Pathologist, German Hospital, New York. 27 illustrations, 2 colored plates and 8 charts. Philadelphia, P. Blakiston's Son & Co., 1912. $3 net.

Immunity is a work designed to serve a purely practical purpose, in familiarizing the student and practitioner with the methods of serum diagnosis, which, on account of their growing clinical significance, are constantly stimulating greater interest in all branches of medical science. The German author, while giving instruction on the subject, realized that it would be of great help to both the medical student and the physician to possess a short text-book which would review in a purely critical form the various methods of immunity diagnosis; and as the two systems of *Kolle* and *Wassermann* and *R. Kraus* and *Levaditi*, which are the standards on the subject in German medical literature, are large and expensive, being more suited to the specialist, it was the aim of the author to produce a work in a more concise and more simple form, adaptable to the general practitioner who wishes enlightenment on the subject, rather than to go into an exhaustive study of it.

The chapter on vaccines has been slightly revised and elaborated to conform more closely with the most recently advocated methods of Sir A. E. Wright, otherwise the American author has found no need to alter the original text, except that occasionally some features, thought to be of especial interest to the English-reading public, have been inserted. And while the book was especially written for medical students and practitioners, we are sure that the chapters on anti-rabic vaccination of man, tuberculin diagnosis, agglutination (macroscopic, microscopic and group), the method of complement fixation with the Wassermann-Bruck's modification and the technique for the determination of the opsonic index, will be just as interesting to the progressive veterinarian as to the physician. The author also alludes to the place attained by mallein as a diagnostic of glanders in veterinary medicine. Colored plates, showing the Pirquet reaction and the ophthalmo-reaction for tuberculosis in the human, are very clear and very striking. The paper is good; the type clear, and, in fact, the publishers have spared no detail in making the work one that any physician or veterinarian may be proud to possess.

PHARMACEUTICAL BACTERIOLOGY.

PHARMACEUTICAL BACTERIOLOGY, WITH SPECIAL REFERENCE TO DISINFECTION AND STERILIZATION, by Albert Schneider, M.D., Ph.D., Professor of Pharmacognosy, Histology and Bacteriology, California College of Pharmacy; Pharmacognosist, United States Department of Agriculture; with 86 illustrations. Philadelphia, P. Blakiston's Son & Co., 1912. $2 net.

Pharmaceutical Bacteriology should find a welcome place in the library of all progressive veterinarians, most of whom are in reality practicing pharmacists. Comparatively speaking, the science of bacteriology is not new, but its introduction into pharmacy is of very recent date; and yet, the pharmacist *should* have a fair knowledge of *general* bacteriology, in order that he may realize what important relationships bacteria bear to medical and veterinary practice. He should know what pharmaceutical preparations and what medical substances are likely to be attacked by bacteria, and what changes they are capable of producing in such substances.

This little volume is the product of the progress incident to the recent growth and development of the professional side of pharmacy, and the object of the author has been to adhere strictly to the subject from the standpoint of the pharmacist, with only enough treatment of general bacteriology to make clear the collateral relationships, especially as it pertains to medical bacteriology. And yet, when one glances through the work, the impression that all the bacteriology that a practitioner can ever absorb or apply is contained in the little work, seems evident. And as a matter of fact, it is the practical side of bacteriology that is presented. Following the introduction and the general morphology and physiology of bacteria, comes their range and distribution, then bacteriological technic, bacteria in the industries, giving the function of bacteria in agriculture, in milk and in the dairying industry, rotting bacteria, cider making, etc.,; immunity, natural and acquired, Ehrlich's side-chain theory, toxins and antitoxins, agglutinins, precipitins, lysins, opsonins, etc. The manufacture and use of sera and vaccines, and a thousand and one practical applications of pharmaceutical bacteriology.

Disinfection and sterilization receive *especial* attention, and altogether *Schneider's Pharmaceutical Bacteriology* is an essential to the up-to-date, progressive veterinarian or physician. As in the former work by the same author, material and workmanship have not been spared in its production.

OBITUARY.

WILLIS WARD CURRY, D.V.S.

Dr. Willis Ward Curry died at Oradel, N. J., on December 7, 1912, suddenly, from hemorrhage of the lungs, in the fifty-third year of his age, although the doctor's health had been failing for some time.

Dr. Curry was born at Mahopac Falls, Putnam County, N. Y., April 29, 1860; his parents (both deceased) having been Peter B. and Elizabeth R. Curry. The doctor received his early education in the public schools of Putnam County (N. Y.) and the Albany State Normal School. On reaching manhood, his love for animals prompted him to take up the study of veterinary medicine, and he entered the American Veterinary College, New York City, from which institution he graduated in 1888 and served in the hospital as House Surgeon under Prof. Liautard; afterward accepted appointment in the B. A. I. service, stationed at Jersey City, and finally, in 1890, entered into general practice in Hackensack, N. J., where he enjoyed a successful practice and the confidence and respect of the community up to the time of his failing health some months ago. Dr. Curry was married in June, 1890, to Elizabeth Courtney Shackelton, of Hackensack, who survives him.

KIND EXPRESSIONS OF SYMPATHY ACKNOWLEDGED.

Complying with a request made by Arthur S. V. Brenton that the REVIEW publish the details relative to the sudden death of his mother, in view of the fact that the family has been overwhelmed with letters and telegrams, which in the depth of their grief they feel unequal to answering, yet desire to thank their many friends for their expressions of sympathy, we give the following details, extracted from her son's letter of December 13, 1912. Mrs. Brenton, though robust in appearance, had been ailing for about

ten years, and about six years ago her physician pronounced her case diabetes mellitus, for which condition she had been treated and dieted ever since; and it was her thorough and intelligent comprehension of her condition and her care and strict dieting that kept her in such apparently good health, despite her malady. She had frequently expressed how well she enjoyed the A. V. M. A. meeting at Indianapolis after her return home from that city, but seemed to dread the approaching winter, and was about to make arrangements to go south during the cold weather, when she was stricken down. She had overexerted herself in the early part of the week in which she died, but did not seem to evince any bad effects from it until the middle of the week, when after an automobile ride with her son, Dr. Willis L. Brenton (during which she expressed great delight and enjoyment, meeting many friends during the ride), on returning home she became suddenly very weak and had to be lifted from the car. She soon recovered from this weak spell, however, and began attending to the preparation of supper. That was on Thursday evening, and the following morning the weakness returned, and she made vain attempts to tell about her ride of the afternoon before, but was so weak she could not finish out a connected sentence. She continued to grow weaker until about two o'clock in the afternoon, when she was put to bed, when she soon sank into a comatose state, from which she never aroused, but passed to her Heavenly Father the following noon (Saturday, November 23), surrounded by the members of her family and her physician at her bedside. She was buried in Grand Lawn Cemetery with Episcopal services on Tuesday, November 26, 1912. Mrs. Brenton was born in Geelong, Australia, fifty miles from Melbourne, and came to this country when a girl of sixteen. Had she lived until December 1, 1912, she would have reached the thirty-second anniversary of her marriage to Dr. Samuel Brenton, which occurred in Jackson, Mich., in 1880. Besides her husband, she is survived by three children, Arthur S. V. Brenton, Dr. Willis L. Brenton and her daughter, Mrs. A. P. Schiffer.

Dr. E. M. Herrin, of Edwardsville, Ill., an old subscriber to the Review, died in May last, but it was not until his subscription expired that the Review learned of his death. Hence the late notice.

SOCIETY MEETINGS.

NOTES ON THE RECENT MEETING OF THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION AT CHICAGO.

The yearly gathering of this truly representative body, including stock breeders as well as sanitarians from almost every state in the union, which convened at the Hotel Sherman, Chicago, December 8, 1912, seems singularly appropriate as to time and place, occurring as it does simultaneously with the annual International Live Stock Show, which represents the sum total of human achievement in the science of stock breeding, as does the yearly meeting of this great sanitary organization bring forth all that has yet been revealed in that branch of veterinary science devoted to live stock sanitary control.

The association was welcomed to Chicago in a brief but forceful address by Dr. Geo. B. Young, Health Commissioner of the city, who said, in substance, that control over live stock sanitary matters would be accomplished in proportion to the degree in which public opinion was aroused thereto, and referring to the inability of the city of Chicago to demand milk from tuberculin tested herds owing to the anti-tuberculin laws of Illinois, stated that in his belief it would be difficult in Illinois in the future to enact any legislation adverse to sanitary progress, simply to enhance the political fortunes of any candidate for public office.

Dr. Peter F. Bahnsen, of Georgia, who later was elected president of the association, responded in his inimitable manner which is so fully appreciated by his large host of friends.

The address of the retiring president, Dr. M. P. Ravenel, of Wisconsin, embodied data gathered from the reports of the British Royal and German Imperial Commissions on Tuberculosis; and, together with his own authoritative opinions, demonstrated still further the danger, especially to children, of bovine infection. The figures are omitted here, but they are startling.

Dr. Ravenel, who is an ex-president of the National Association for the Prevention of Tuberculosis, stated that one section of next year's meeting of that body was to be given over to veterinarians, and also that the meetings of the Philadelphia Path-

ological Association were open to veterinarians. He stated that inasmuch as the two professions overlap, veterinarians should be members, and vice-versa, the society meetings of the two professions being open to members of either.

In view of the conflicting laws of the several states he urged the united efforts of both professions for the establishment of a central body, in which both physician and veterinarian would be given representation. Allusion was made to the proposed establishment of chairs of comparative pathology in some of the medical colleges, by which the future medical practitioners might be better enabled to co-operate with veterinarians in matters of sanitary reform.

The essays and discussions on tick fever were supplemented by a moving picture exhibition, showing the evolution of the tick and the methods now in use in the South for its eradication. Unlike some of the other communicable diseases, with this, there seemed to be no division of opinion as to the right way to proceed in its eradication, and the reports submitted showed a greatly increased area of territory released from quarantine. Mr. W. L. Wardell, chairman of the Live Stock Commission of Texas, introduced a motion which was unanimously adopted, pledging each member present to visit or write his congressman and senator to urge an increased appropriation for tick eradication and for the Bureau of Animal Industry in its routine work.

The enthusiasm of the essayists and those who participated in the discussion of this subject, which seems to have been so thoroughly worked out, was most certainly inspiring.

Directly and indirectly the tick is responsible for an annual loss of over one hundred million dollars in the South, and its eradication is made possible by ten to sixteen dippings at intervals of fourteen days, at an average cost of ten cents a head.

The tuberculin test, after thorough discussion of the question, received almost unanimous indorsement, and each succeeding year seems to establish more firmly, when used by such men as are truly competent, its right to be very highly regarded as a diagnostic agent.

The abuse of tuberculin by men of insufficient education and experience is the cause of its ill-repute in some localities, and emphasizes the need for renewed efforts to restrict its use to thoroughly trained men.

The paper entitled "The Value of Physical Examination and Clinical Diagnosis in Detecting Tuberculosis in Cattle," pre-

sented by Director V. A. Moore, of the New York State College, was heard with deep interest, befitting the profound knowledge of the author. It appeared, however, that the majority of those who heard this essay were still of the opinion that the value of physical examination as a dependable means of detecting even the so-called spreaders, and thus of being a factor of equal value with tuberculin, is greatly overestimated. A movement to free the pure-bred herds of the United States from tuberculosis, requiring same to be free from this disease, in order to be eligible to advanced registration, was described in a paper read by Dr. O. E. Dyson, of Illinois.

Probably the most spirited discussion of the entire meeting followed the reading of the papers on "Hog Cholera" by Drs. Reichel, Fischer and Peters. It was the serum-simultaneous vs. the serum-alone method; and it must be said that the adherents of the serum-simultaneous method had the better of the discussion, the end of which would not yet have been reached, were it not for the time limit of five minutes placed upon each individual in the discussion, which, by a vote of the members, was afterward increased to ten minutes, as the importance of the discussion became more apparent.

The importance of hog cholera control to the entire United States may be judged by the $15,000,000 loss in Iowa during one year.

The successful use of the serum-simultaneous method depends upon the ability of the operator to comprehend the potency for good or evil of the virulent blood, and his willingness to observe with scrupulous care the technique formulated by careful workers. Used by such men, both its safety and efficacy were attested by Drs. Paul Fischer, of Ohio, and A. T. Peters, of Illinois, as well as others, whose wide experience gave weight to their words. Dr. Peters, stating that so much depended upon a full comprehension of the technique that it had been found necessary in Illinois to require those men unfamiliar with same to visit the station, and there, under careful eyes, to go through the whole procedure again and again, until they showed a thorough understanding of each step. The failure of this method, in some instances, to accomplish what had been expected, was said to be due to highly virulent blood and a serum of low potency, in which case a fatal attack would be caused; or to a blood lacking in a high degree of virulence, failing to produce the expected immunity; or to the neglect of the operator to observe the proper ratio between the dose of the virulent blood and the protective serum. To sum-

marize, the advantage of the V. B. method is the permanent immunity conferred, the disadvantage being the possibility of the spread of infection when carelessly used. The serum-alone method confers usually no permanent immunity; neither is its use attended by dangers of the spread of infection. The essentials for the successful use of the serum-simultaneous method are standardized products, V. B. and serum of known potency, together with carefully trained and conscientious men for their use; and where this combination exists, there should be no hesitancy as to which method to choose.

Dr. Fred Torrance, Veterinary Director-General of Canada, gave a brief outline of the existing sanitary regulations of his country, the items of greatest interest, being the progressive lowering of the number of cases of glanders under the plan of compulsory slaughter of reactors to mallein. It is to be hoped that a similar regulation may be found to be practicable in the State of New York ere long.

Dr. W. L. Williams presented a paper, illustrated with stereopticon views and elaborate tables, in which he summarized his experience with infectious abortion of cattle and the treatment thereof with *Abortus Bacterin,* as well as results of efforts to diagnose the presence of the infective agent by use of a biological product, called Abortin. To many who had perhaps hastily accepted the unqualified statements regarding the value of these products, Dr. Williams' paper was a revelation, inasmuch as his carefully conducted tests indicated the worthlessness of both. Future research and experiment may reverse his judgment; meanwhile it behooves the busy practitioner to proceed cautiously in the use of these and the many other biological products with which the market is flooded.

The recent horse plague in Kansas, Nebraska and other states was the subject of a paper by Dr. A. T. Kinsley, of Missouri, and was well and thoroughly discussed by those men whose scientific attainments had led to their assignment in the work of investigation. Among these may be mentioned Drs. Mohler, Connoway, Tait Butler, Gibson, Hughes, Kaupp and others. In a majority of those who spoke, the opinion was given that the disease was a forage poisoning, careful investigation and examination failing to reveal any specific micro-organism, and efforts to reproduce the disease by inoculation of spinal and cranial fluids being unsuccessful.

A paper of exceptional interest to all was presented by Drs. D. J. Healy and Joseph Castle, of Kentucky, in which they dem-

onstrated the probable determining factor in the onset of the pains of labor to be the calcium salts present in the normal colostrum of the mammaries, which are stimulated to production by the approaching completion of fœtal development.

In the experimental work the subcutaneous injection of a small quantity of colostrum invariably producing abortion in guinea pigs; whereas the injection of milk and cream was borne with no bad results. Calcium lactate and calcium lactophosphate were injected and also caused abortion.

The Committee on Uniform Regulation submitted their report, a copy of which follows:

REPORT OF THE COMMITTEE ON UNIFORM REGULATIONS PRESENTED TO AND ADOPTED BY THE ASSOCIATION AT CHICAGO, DECEMBER 5, 1912.

Section 1. The importation by railroad, boat, in wagon, by express or other common carrier; on hoof or in any other manner, of live stock diseased or exposed to disease into the State of ..... is hereby prohibited; and to determine which fact the following regulations shall be observed by all persons, firms, transportation companies, corporations, express companies and other common carriers; State Veterinarians and all other officials State and Federal, authorized to inspect and issue certificates of health for live stock.

Sec. 2. It is hereby ordered that any person, firm, corporation or any common carrier wishing to import bulls, work oxen or female cattle over six months old not intended for immediate slaughter, into the State of ..... must procure before shipment a health certificate and a tuberculin test chart in triplicate from a Veterinary Inspector of the B. A. I., the State Veterinarian or Assistant State Veterinarian, or a Veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the State from which the cattle are to be transported or moved. The original of this health certificate and tuberculin test chart must be attached to the waybill. The duplicate health certificate and tuberculin test chart must be sent to the State Veterinarian or proper official at destination in ample time to reach him before the arrival of the cattle. The triplicate health certificate and tuberculin test chart must be sent the proper State official at place of origin. The health certificate and tuberculin test chart must show that the cattle are free from Texas fever ticks, tuberculosis and all contagious, infectious and communicable diseases. The tuberculin test chart must show that at least three temperatures were taken before injection of tuberculin two to three hours apart and five temperatures were taken after injection two hours apart, beginning ten hours after the tuberculin was injected.

Sec. 3. It is hereby ordered that any person, firm, corporation or any common carrier wishing to import horses, mules or asses into the State of ..... must procure before shipment or movement in any other manner a health certificate and a mallein test chart in triplicate from a Veterinary Inspector of the B. A. I., the State Veterinarian or Assistant State Veterinarian, or a Veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the State from which the horses, mules and asses are to be transported or moved. The original, duplicate and triplicate copies of the health certificate and mallein test chart shall be handled as certificate and tuberculin test chart as provided for in Section 2. The health certificate and mallein test chart must show that the horses, mules or asses are free from all contagious, infectious and communicable diseases, and the test chart must show

that at least three temperatures two to three hours apart taken before injection and five temperatures were taken after injection two hours apart, beginning ten hours after the mallein was injected.

Sec. 4. It is hereby ordered that any person, firm, corporation or any common carrier wishing to import sheep or goats into the State of ..... for purposes other than immediate slaughter, must procure before shipment or movement in any other manner a certificate of inspection issued by an inspector of the United States Bureau of Animal Industry, certifying that the sheep or goats are not affected with any contagious, infectious or communicable disease, including scabies, and that they have been dipped once within ten days of time of entry into the State in either a nicotine or lime-and-sulphur dip which has been approved by the United States Bureau of Animal Industry. Provided, however, that sheep and goats not accompanied by certificate as above indicated may be shipped by rail or boat to points within the State of ..... if billed to or through public stock yards where Federal Government inspection is maintained, and there unloaded and dipped under the supervision of an inspector of the United States Bureau of Animal Industry.

Sec. 5. It is hereby ordered that any person, firm or corporation or any common carrier wishing to import swine into the State of ..... for purposes other than immediate slaughter must procure before shipment or movement in any other manner a health certificate in triplicate from a Veterinary Inspector of the B. A. I., the State Veterinarian or Assistant State Veterinarian or a Veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the State from which the swine are to be transported and moved. The original, duplicate and triplicate copies of the health certificate shall be handled as certificates and tuberculin test chart as provided for in Section 2. The health certificate must show that the swine are free from all contagious, infectious and communicable diseases and have been immunized against hog cholera by the Dorset-McBride-Niles Serum not more than thirty days prior to shipment.

Sec. 6. It is hereby ordered that cars, boats and other vehicles used in the transportation of all live stock into or within the State of ..... shall first be cleaned of all litter, washed and disinfected with a mixture made with not more than 1½ pounds of lime and ¼ pound of pure carbolic acid to each gallon of water or liquid cresolis compositus (U. S. P.) (6) six ounces to every gallon of water.

Dr. J. A. KIERNAN, Nashville, Tenn.,
Dr. M. E. KNOWLES, Helena, Mont.,
Dr. J. I. GIBSON, Des Moines, Iowa,
Committee.

Dr. C. A. Carey, of Alabama, spoke in strong terms of the need of instruction in the veterinary colleges of inter- and intrastate laws and regulations concerning communicable diseases of live stock and their movement, of which, he stated, so many practitioners were ignorant. Besides those previously referred to, papers of great interest were read by Drs. J. G. Wills, of New York; J. I. Gibson, of Iowa; Cassius Way, of Illinois; G. Ed. Leech, of Minnesota, and John Reichel, of Pennsylvania; all of which brought out valuable facts in the discussions.

An official invitation from the Live Stock Commission of the Panama Exposition was tendered the association, to hold its 1915 meeting in San Francisco, in connection with similar organiza-

tions of other countries, on this occasion, to make the meeting of international concern.

Prof. Ferguson was re-elected secretary-treasurer, and was given a vote of thanks for his good work, which most certainly has had much to do with the present prosperous condition of the association.

At the adjournment of the meeting there was a feeling among the members almost without exception that the association, having maintained and strengthened its position as a dignified scientific body, would each year grow stronger and greater, thus justifying the enthusiastic statement of the secretary-treasurer that it is the greatest organization of its kind in the world.

NOTE—We desire to acknowledge indebtedness to our esteemed colleague, Dr. Percival K. Nichols, of the New York City Board of Health, for the foregoing interesting and comprehensive account of the recent great meeting of the U. S. Live Stock Sanitary Association at Chicago.

NOTES ON THE THIRTIETH ANNIVERSARY OF THE ILLINOIS VETERINARY MEDICAL ASSOCIATION.

The above association went into session at the Lexington, Chicago, immediately following the close of the U. S. Live Stock Sanitary Association, and President James Smellie, of Eureka, had the pleasure of presiding over a full meeting, as about 350 members were present. Owing to the fact that the U. S. L. S. S. A. had just preceded the Illinois state meeting, it was convenient to a number of distinguished members of the profession from other states to participate in the proceedings. Prominently among them we find Dr. John R. Mohler, of the Bureau of Animal Industry, Washington, D. C., presenting a paper on "Forage Poisoning with Special Reference to the Recent Outbreak in the Western States," and Prof. W. H. Dalrymple, of the Louisiana State University, who presented a most interesting paper entitled "Some of the More Important Insects Affecting Our Farm Animals." Dr. A. S. Alexander, of Wisconsin, discussed an important paper presented by Dr. J. M. Wright, State Veterinarian of Illinois, entitled "Illinois Stallion Registration Law." Prof. B. F. Kaupp, late of Colorado, presented a paper on "Contagious Abortion." Dr. A. T. Peters, of the Illinois State Laboratory, presented an excellent paper entitled "Open Tuberculosis"; and "Rabies as a Sanitary Problem" was the subject of a scholarly essay by Dr. C. A. White, of Chicago. On the evening of the

first day Professor Maxmillian Herzog, of Chicago, gave a most instructive illustrated lecture on "Cancer of Domestic Animals." The second evening was devoted to a banquet, which was well attended; there were a number of invited guests present, and many excellent after-dinner addresses were heard. The last day was given over entirely to a clinic at the Chicago Veterinary College. It was altogether a most excellent meeting, and we trust that Secretary Merillat, whom the association honored by re-election, will furnish us *his* report of it in the near future. Dr. J. F. Ryan, of Chicago, one of the faithful attendants at the A. V. M. A. meetings, was elected president of the organization, and the REVIEW congratulates him on receiving this merited token of high regard from his colleagues in Illinois.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

The third semi-annual meeting of the above association was held at the Vanderbilt Hotel, Syracuse, N. Y., on Wednesday, November 27, 1912. As a preliminary to the business session a clinic was held at the infirmary of Dr. H. A. Turner, No. 812 South Salina street, Syracuse, N. Y., at which several interesting subjects were operated upon. Dr. Hollingworth and Dr. Turner, assisted by others, performed the operations.

When the meeting convened at the Vanderbilt Hotel, the following members were found to be present: W. G. Hollingworth, J. A. Pendergast, A. J. Tuxill, Frank Morrow, R. M. Weightman, H. A. Turner, F. E. York, E. E. Dooling, W. L. Clark, J. C. Stevens, W. B. Switzer, J. M. Currie, Wilson Huff, A. E. Merry and E. W. Fitch.

The following visitors were also present: Dr. Taylor, of Henrietta, N. Y.; Dr. Cook, of Rochester, N. Y.; Dr. Tegg, of Rochester, N. Y.; Dr. Webber, of Rochester, N. Y., and Merritt A. Switzer, attorney for the Association, of Oswego, N. Y.

The following new members were received: H. V. Crandall, Syracuse, N. Y.; J. H. Hewitt, from the New York State Agricultural College, Morrisville, N. Y.; H. V. Stebbins, West Winfield, N. Y., and Frank Fowler, Mexico, N. Y.

The work of prosecution of illegal practitioners within the territory of this association, which has received careful attention during the past year, was placed before the meeting for discussion. The attorney for the association, Merritt A. Switzer, of Oswego, N. Y., outlined the work which had been done by the

prosecuting committee through his office. He showed that while no actual prosecutions have been found necessary, yet a considerable number of men, at least 50 per cent. of those reported within the year, had been forced to desist, and that no further complaints had been received against the majority of those who had not been reported as having desisted. After several of the members had expressed their opinion that the work should be continued along the lines already adopted, a resolution was offered by the prosecuting committee authorizing the said committee to begin prosecution against any men or man found to be practising within the association's territory illegally, and against whom sufficient evidence could be obtained.

Perhaps the most interesting action taken at this meeting, and one which more than any other thing will tend to the advancement of the profession and the unity of its members, was that taken in pursuance of the suggestion of Dr. W. G. Hollingworth, in relation to the matter of providing protection for the members of the association against any unjust prosecutions for malpractice and the like. The plan, as outlined by Dr. Hollingworth, will, when developed, make it the duty of the association, when such an action shall have been instituted against any member thereof, to investigate by committee the facts and circumstances of the case, and if, in the judgment of that committee, the prosecution shall be deemed unjust, the association shall defend the action, providing therefor the necessary funds and legal talent. It is claimed for this system of protection that the members of the association will be more closely united in interest, that they will be freed from the liability of being harried by those who have no just grounds for complaint, and that in this way the association itself will become of greater value to its members and be more worthy of their support. The action taken upon this suggestion consisted of the appointment of a committee, of which Dr. Hollingworth was made chairman, for the purpose of outlining and perfecting the plan, its report to be made in the form of a resolution, proper for the purpose of its inauguration, to be presented at the next annual meeting, to be held in June, 1913. This association thus becomes the pioneer for this state in taking such action for the protection of its members.

Other matters of business were taken up, after which interesting papers were presented. Dr. Merry, of Syracuse, spoke upon the inspection and control of meat by the municipality. In this he advocated that there should be a uniformity in the manner of disposal of carcasses declared to be diseased; expressed

his belief that all inspectors should be qualified veterinarians, and also favored the establishment of public abattoirs whenever practicable. Dr. Huff, of Rome, municipal meat and market inspector, gave other interesting facts in the course of the discussion which followed, as did Dr. Hollingworth, of Utica; Dr. Tegg, of Rochester; Dr. Stevens, of Cortland, and others.

Dr. Stevens gave an interesting case report under title of "An Uncommon Case," apparently a case of colic, in which the patient died, and upon post mortem the abdomen was found to contain a large amount of crushed stone, broken nails, tacks and brass wire.

A case of pleuro-pneumonia was reported by Dr. Tuxill. Autotherapy was not used in this case, but in the discussion which followed many favorable and adverse criticisms thereof were made.

The thanks of the association were extended to Dr. H. A. Turner for the use of his infirmary for the purpose of the clinic.

This meeting proved to be by far the most interesting of those yet held by this Association in the three short years of its existence, and it has found an important place and is filling an important need in the ranks of the profession for this section of the state.

While no banquet was held, many of the members gathered in the dining-room of the hotel at the close of the session for an enjoyable meal together before going out to take their appointed place in the work of the days to come.

W. B. Switzer, Secretary.

THE NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION.

The above association convened in semi-annual session at Upper Sandusky on November 20, 1912.

President J. V. Newton opened the meeting at 10.30 a. m. and introduced Dr. Walter M. Smalley (M.D.), of Upper Sandusky, who gave the address of welcome.

Dr. W. A. Axby, of Harrison, responded in his usual pleasing manner.

The regular order of business of the association was then proceeded with, and election of new members. Nine were recommended by the Board of Censors as being qualified for membership.

The literary program was then taken up, the first number of which was a paper on " Cutaneous Quiltor as a Sequel to In-

fluenza," by Dr. John E. Turner of Kenton. Following the reading of the paper, many veterinarians present earnestly discussed the subject.

Adjournment for dinner was then taken.

Dr. Newton called the meeting to order again at 1.30 p. m., when Dr. Reuben Hilty presented his paper on "Hog Cholera Immunizations and Treatments," which was heard with great interest, as this malady deals out more daily loss in Ohio than any other disease of domestic animals. Many veterinarians entered into the discussion, making the subject of hog cholera one of great interest.

Dr. J. H. Blattenberg gave some practical suggestions along the line of surgical technique.

Dr. R. C. Longfellow (M.D.), Toledo, pathologist and bacteriologist to the association, gave the members a cheer and elaborated at length on the advancement of the profession, and placed emphasis on the personal appearance of the veterinarian as a valuable aid to that end.

Dr. S. W. Bailey opened the discussion on "The Advice to an Owner of a Tuberculous Cow." He said he advised that the animal be tested and if reacted to the test to be driven to a slaughter-house, where there is a government inspector, where the result of the test may be confirmed.

Among the visitors were Drs. E. H. Shepherd, of Cleveland; L. P. Cook, secretary of the Ohio State Veterinary Medical Board, of Cincinnati; Drs. W. A. Axby and T. F. Jones, of Newark, and W. E. Clemmons, of Granville.

Dr. Cook, in response to a call from the Chair, made a few remarks along the line of present needs of the veterinarians of Ohio. He being a newly elected senator to the general assembly of Ohio, from Hamilton County, thought that he could be of much assistance in the legal needs of Ohio's veterinarians. Several resolutions were adopted at Dr. Cook's suggestion, but space will not permit us to give them here, except one, which was a resolution to place a veterinarian on the State Board of Health. Dr. Axby was endorsed by the association as being qualified for the position. A committee was appointed to wait on the Governor in relation thereto.

The meeting then adjourned to meet in the banquet room of Hotel Gottfried. About 60 veterinarians and visitors (included among the latter, the physicians of Upper Sandusky) sat down. An orchestra furnished music, and several of Dr. Newton's favorite selections were rendered.

Dr. Newton acted as toastmaster and filled the place in a manner that delighted every one.

Toasts were responded to by Dr. Walter M. Smalley and other physicians of the city; also by Drs. Shepherd, Jones, Kline, Blattenberg, Longfellow, Axby, Cliffe and Clemmons.

The meeting adjourned to meet at the call of the Chair.

E. V. HOVER, Secretary.

FIFTIETH ANNIVERSARY MEETING A. V. M. A.—Although still very early in the year, the local committees are shaping matters so that they will be in a position to make definite plans quickly later on. As a result of a recent meeting in New York, at which Chairman Hoskins took the reins (having been appointed to succeed Dr. Winchester, resigned), the following tentative plans were outlined:

The opening session will be held on Monday morning, September 1, at 10 o'clock. There will be six other general sessions as follows: Tuesday, Wednesday and Thursday at 10 a. m., Monday and Wednesday at 8 p. m., and the closing session on Friday at 2 p. m. The afternoons of each day, except Friday, will be devoted to section work. On Friday section work will be conducted in the forenoon.

On account of a resolution adopted at the last annual meeting it will not be possible to conduct the meetings of the Association of College Faculties and Examining Boards as a section, but it is proposed to have three meetings of this association, one on Monday, Tuesday and Wednesday, during the same time that the sections are in session.

A symposium on surgery has been arranged for Tuesday and no session of the Section of Medicine will be held on this day, as it was thought that those interested in general practice will wish to attend the symposium on surgery. A symposium for the Section on Medicine has been arranged for Wednesday, affording an opportunity for those interested in the Section on Sanitary Science and Police to attend. A symposium for the Section on Sanitary Science and Police can be arranged for Thursday and those interested in the Section on Medicine may attend.

It is proposed to invite five distinguished scientists to attend the meeting as the guests of the association, one of whom is to give a talk or paper at the opening of each general session, except perhaps the opening general session to be held on Monday morning.

AMERICAN VETERINARY REVIEW.

FEBRUARY, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, DECEMBER 15, 1912.

ECHOES OF COMPARATIVE PATHOLOGY CONGRESS.—I intended to make a general review of this Congress, but I found the quantity of the material offered, that of the communications presented and of the reports read and discussed, so enormous, that I preferred to limit my remarks to the few subjects concerning principally veterinarians, referring the inquirers to the two volumes which will contain everything which was spoken of at the Congress; and again in my review will refer principally to the conclusions of the various reporters.

* * *

In the section of Parasitology, Prof. A. de Jong, of Leyden, in his report on *Mycosis* common to man and animals has concluded:

1. In the countries where many cases of trichopyty in man are observed, due to a similar disease of cattle and horses, it is recommended to fight these diseases in the animals with official sanitary measures;

2. In countries where skin diseases are common in dogs, specially among loose and erring animals, the diseased ones must be secured by the police, unless the owner can show a veterinary certificate declaring that the disease is not dangerous to man;

3. It is the duty of veterinarians, in cases of trichophyty or

microsposy in animals, to take as much as possible all necessary precautions to avoid the infection to man;

4. Veterinarians must also take all necessary measures to avoid the infection of man by favic-animals;

5. Sporotrichosis being observed as cutaneous and subcutaneous mycosis in horses and dogs, the preservation of the health of man demands inquiries upon the frequency of those affections in animals;

6. As it appears possible that among the cases of diseases in horses known as "epizootic lymphangitis" (saccharomycosis, cryptococcosis) and "hyphomycosis destruens," there are cases of sporotrichosis, a disease which can infect man, it is important that the study of these diseases be made over again so as to reach a positive diagnosis.

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The questions of the relations of *aviary and human diphtheria* were also considered by several members of the Congress.

Among the reports presented relating to the subject was that of Dr. Ferdinand Arloing, Professor at the Faculty of Medicine of Lyons. His deductions were as follows:

1. Aviary diphtheria is to-day well known as far as its symptomatology and its clinical forms. It has been differentiated from the other diseases of birds, which present analogous localizations (tuberculosis, mycosis and specially contagious epithelioma);

2. There remain on the contrary, diversities of opinion concerning its etiology; for some it is a parastic or a microbian disease; some attribute it to the diphtheric bacillus of Klebs-Loeffler, or again others make it depend upon specific microbes, different from Loeffler's bacillus, and finally others say that it is due to non-specific common bacilli;

3. From bacteriology, it is right to conclude to a polymicrobian origin of the diseases, Loeffler's bacillus and other various microbes.

4. Pathological anatomy would allow without doubt the veri-

fication of the data shown by bacteriology, according to the cases and the differences between the lesions;

5. All these facts show that in all the cases, there is no unity of cause between human and aviary diphtheria;

6. In the present condition of the question, it is shown by clinical observations that reciprocal contagion is possible between animal and man and that pseudo-membranous sore throats may occur;

7. When animals and particularly fowls are affected with diphtheria by Loeffler's bacillus, they may become for man the cause of a true diphtheria.

8. To the point of view of hygiene and prophylaxy, inter-human contagion must always be considered as the capital cause of diphtheria in our species, but we also think that ought to be considered as contagious for man all pseudo-membranous affections, diphtheretic or not, of fowls and that all necessary preventive and curative measures ought to be taken.

* * *

Rabies.—Rabies was evidently a disease which was to occupy the attention of congressists and to call for many reports. Besides those of Prof. Babes, inexhaustible document of great value, of Prof. Remlinger and others, there is one from Dr. (Mrs.) Luzzani Negri on the etiology and diagnosis of rabies, which can be resumed as follows:

It is known that for quite a long time Dr. Negri has demonstrated the existence in the nervous system of rabid animals of peculiar granulations which are commonly designated as the corpuscles or bodies of Negri.

Those are nothing else than the specific parasite of rabies, so much so that it can be firmly said that, by the simple fact of the demonstration of this parasite, we have a sure and quick means of diagnosis of rabies, a means which includes and presents all the advantages that have often been asked unsuccessfully from the other methods used to this day. To the biological proof of the inoculation in animals, one can indeed substitute the research

of the Negri bodies in all the cases of positive data, with the advantage of rapidity and allowing the examination in even bad conditions of conservation. In all cases, without exception, it may take the place of the microscopic proof and of the searching for the lesions of Gehuchten and of Nelis. It is true that this last is quicker than the biological method, but it is also true that it is a longer and more difficult method than that of searching the parasite; besides, it requires organs in a good state of conservation; and at any rate has not an absolute specific value, the same alterations being likely to be met in other diseases of man or animals and even in old normal dogs.

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Tuberculosis has also occupied the attention of the Congressists. From among the reports I merely resume that of Director H. Vallée of Alfort, on the *road of entrance of Koch's bacillus in the organism of different species,* a question which has given rise already to many discussions and experiments and which seems to be settled now.

For a long time it has been known that it is sufficient for the existence of a first bacillar centre, to see the infection develop, with a variable type or different localization.

But how is that first centre formed? What is the entrance door of the bacillus?

As an ordinary rule it is admitted that this entrance takes place by three great roads: pulmonary, intestinal, bucco-pharyngeal.

The importance of each one is different but their reality is not doubtful.

Recognized since the first experiments of Villemin and of Koch, the facility of the transmission of tuberculosis by the air passages was first discussed. The more recent experiments of Chausse have established without doubt that for the future the capital role of the inhalation of germs in the production of pulmonary tuberculosis must be admitted.

In relation to the infection by the digestive tract, various opinions have been advanced.

As early as 1868 Chauveau proved that tuberculous infection always follows when the digestive canal is used as a road for contagion, when tested in bovines. At present this is denied by some—the difference being explained by variations in the conditions of the experiments.

If indeed the possibility of the intestinal infection cannot be denied, the conditions deserve discussion. The success of the infection depending on the choice of the germs, their state of division at the time they are taken in, the age of the animals, etc.

For the bucco-pharyngeal infection, although it is less frequent, it is not doubtful.

The frequent presence of the bacillus of Koch in the nasal cavities and upon the amygdales is a serious basis to this conception of the contagion in this way.

To resume, outside the accidental modes of infection, by cutaneous abrasions, traumatisms, contamination of a wound, physiological conditions permit the entrance of the bacillus of Koch, through the air passages, the digestive tract, and the bucco-pharyngeal region.

But if the entrance of the bacillus can equally take place by either of these ways, the condition of life of the different species give to each of these modes of infection an unequal importance. Contagion by inhalation has a predominating action in the infection of man and of bovines kept in permanent stabulation. On the contrary, it is ingestion which gives rise most commonly to tuberculosis in the other animal species and in bovines kept in common pastures or that go to public drinking places.

* * *

Intra-bronchic and Intra-pulmonary Injections.—Is this a new open field of treatment applicable to diseases of the respiratory apparatus and if since several years intra-tracheal injections have been resorted to with a therapeutic object by Prof. Levy of Italy, yet they have not entered the domain of extensive

application. It is true that injections of small quantities have been made, but still there were unbelievers of the good to be obtained and of the possibility of the penetration of the injected

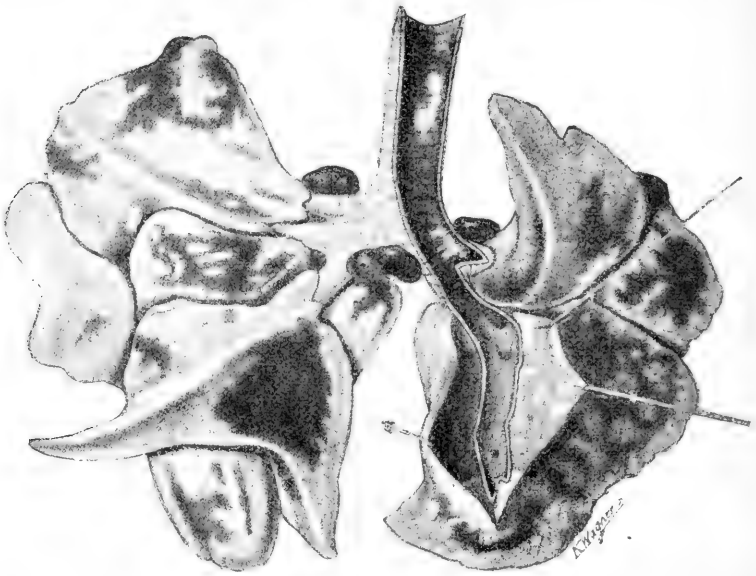

FIG. 1—Lungs, showing penetration of colored liquid on the surface of the pulmonary tissue, in its thickness, in intertracheo-bronchic lympth glands. (Dog received 10 c.c. of blue of methylene and killed 15 minutes after the injection.)

liquid into the lungs and of their tolerating large quantities of liquids.

If, as Drs. Guisez and G. Stodel have done, with a special syringe, with long canula, having its end pierced with holes, like a watering pot, introduced through the mouth of dogs under the influence of morphine or chloroform, intra-bronchic injections are made of coloring matters, of subnitrate of bismuth, allowing radioscopy and radiography, what are the results?

First. *Injections of Coloring Matters.*—Blue of tolindine in suspension in oil injected can be seen as having penetrated in the entire aerial tree.

If 10 c.c. of such solution at 1 per cent. is used and the animals killed after 15 and 30 minutes, 24 and 36 hours, in what conditions are the lungs found?

After 15 minutes the respiratory tree is entirely injected and isolated spots of colored surfaces are observed (Fig. 1).

After 30 minutes the external coloration is more marked and is nearly complete after an hour (Fig. 2.)

After 24 to 36 hours the broncia and their ramifications are still colored and the pulmonary structure is colored with large spots plainly seen (Fig. 3.)

Second. *Injections of Subnitrate of Bismuth.*—If an injection of 10 to 20 c.c. of oil holding in suspension subnitrate of bismuth in proportion of 60 per cent. is made, radioscopy is perfectly clear, better than radiography, yet 48 hours after

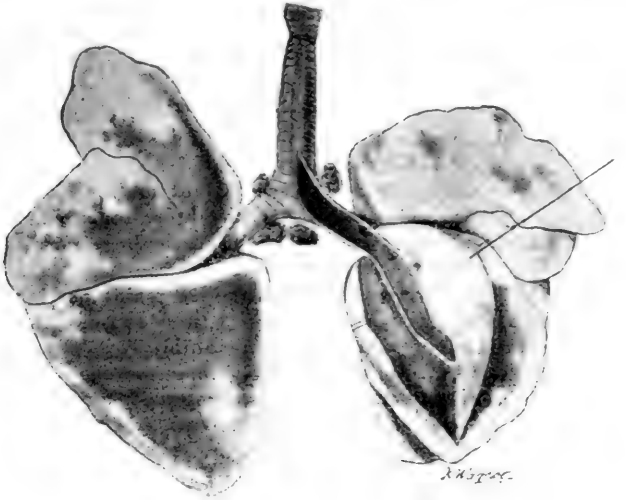

FIG. 2—Showing the penetration of coloring substances: (1) on the surface of the lungs; (2) in the mediastine lymph glands. (Dog was injected with 10 c.c. of blue of methylene and killed 30 hours after.)

the observation radiography reveals the presence of the bismuth in the intestine.

During the experiment, the dogs evinced no trouble of the respiration, which remained normal. Death occurred in them with toxic-gastro-enteritis, between six and twelve days after the injection.

These experiments show that by this method the pulmonary

apparatus can be injected with perfect safety and also the entire parenchyma can be impregnated.

To the point of view of therapeutic applications, the experiments have shown that administered by the trachea, the

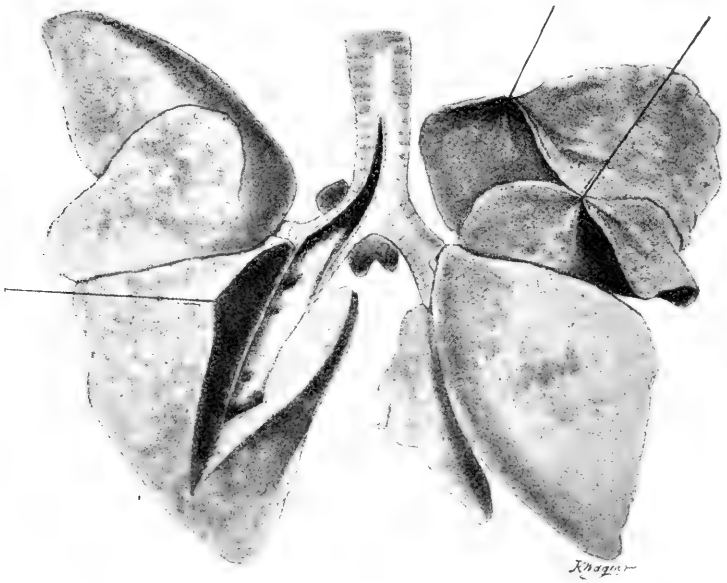

FIG. 3—Showing the penetration and diffusion of the coloring matter on the surface of the lungs. (Dog had received, at 24 hours apart, two injections of 10 c.c. of blue of methylene and was killed 24 hours after the second injection.)

contact of a drug with the lung tissue lasts longer than if given by intra-venous injection. And, besides, larger doses of blue of methylen can be supported without any complication when given by the trachea, while it would prove fatal if given through the veins.

Now what are the practical applications of this new therapeuty?

As active solutions, there were used gomenol in oil from 5 to 10 per cent. and gaiacol in oil at 5 per cent.. Iodoform was sometimes added to the oil, or again 5 per cent. solutions of argyrol.

In tracheal and tracheo-bronchial affections improvement was rapidly manifested and radical recoveries after eight or nine injections.

Five cases of tracheal ozena were radically cured. Three cases of broncho-pulmonary infection following the presence of intrabronchic foreign bodies, ten cases of bronchial dilations. All were benefited by this mode of treatment. And even in pulmonary gangrene the results were peculiarly brilliant. Experiments have also been made with pulmonary tuberculosis in which the results were less satisfactory.

Those applications may not all find their indications in veterinary practice and yet there are probably conditions where their trials might be justifiable. Could not chronic bronchial affections and even pulmonary gangrene be among them?

* * *

SUPPURATIVE KERATITIS.—This affection is one which is quite frequently met with, specially in dogs, and as complications of infectious diseases of the cornea, they are often the cause of much trouble to the attending surgeon. Professor Dr. J. Baudry has called attention to the treatment of this disease which deserves publicity, says the *Presse Medicale*.

The use of the tincture of iodine as disinfecting, and caustic in cases of corneal ulcerations and abscesses gives always satisfactory results, which sometimes are wonderful. With a very fine hair brush dipped in a small quantity of tincture, the centre of the ulceration is slightly touched after cocainization of the eye. The iodine spreads round the spot with which it has just been in contact and penetrates some in the infiltrated surrounding region. Instead of the brush, a fine probe with a little hydrophilous cotton or a glass rod can be used to make the application. Even if these have been made several times, no inconvenience results. A positive contra-indication is not to use mercury salts at the same time as the iodine. As there will be formed a precipitate of insoluble mercurial iodine, caustic and dangerous, besides the appearance of excessive pains that nothing can allay.

The action of the tincture of iodine is generally quite rapid;

often two or three applications being sufficient to arrest or remove an hypopyon.

It is only when this mode of treatment fails, by the specific virulency of the microbe, the presence of a suitable soil, or specially a reinfection that an operation, that of Soemisch, is advisable, when extensive prolapsus of the iris exists.

* * *

INTERNATIONAL VETERINARY CONGRESSES.—The celebrations at Lyons have been the opportunity for the Permanent Committee of the International Veterinary Congresses to hold a meeting. It was on the twenty-fifth of October, 1912, when nineteen out of the twenty-four members answered to the call of Dr. Lydtin, the president of the committee. These were Dr. Bang, of Denmark; Barrier, of France; Hauka, of Austria, representing Dr. Binder; Professor Degive, of Belgium; Happich, of Russia; Heiss, of Switzerland; Hutyra and de Ratz, of Hungary; de Jong and Schimmel, of Holland; Kjerrulf, of Sweden; Locusteanu, of Roumania; Sir John McFadyean and Stockman, of England; Malon, of Norway; Perroncito, of Italy; Piot Bey, of Egypt; Theiler, of South Africa.

The committee was received by Director Faure.

Among the official business of the meeting were a discussion on the definitive acceptation of The Hague as the permanent seat of the committee. Then came propositions made by Sir John McFadyean and Stockman in relation to the organization of the London Congress in 1914. The first week in August being selected, the day to be fixed later on. Sir John McFadyean and Stockman stated that they were assured of contributions amounting to about $20,000.

The tenth congress will be with the commemoration of the fiftieth anniversary of the foundation of the International Congresses.

A national committee of propaganda is to be organized by every member of the permanent Commission, one in each country.

The program of the International Congress will be published at an early date.

* * *

PRACTICAL TREATISE OF HORSESHOEING (*Traité Pratique de Maréchalerie*) by Mr. J. Tasset, professor of horseshoeing at the cavalry school of Saumur, published by J. B. Bailliere & Son, 19 rue Hautefeuille, Paris.

This little volume of 480 pages is addressed to blacksmiths, veterinarians, horsemen, etc., and is written well up with all new scientific data and practical applications.

After a concise review of the history of horseshoeing and the origin of the use of nails to hold the shoe, the author considers the anatomy and the physiology of the foot, which gives him the opportunity to reproduce some excellent plates.

The shop of the blacksmith, with its various tools and the essential material used, occupy the third part of the work, which is followed by a study on the shoe itself, its fabrication by hand or machine, that for saddle horses and for draught, light and heavy, that for the army horse and finally that for winter and ice weather, the sharpening of the shoe.

The various manipulations of the shoeing are minutely considered. The special shoeings and their numerous varieties to arrive at the pathological shoes, to those required for defective feet or those appropriated to accidents on horses while in action or at rest, for the horse that stumbles, that forges, that interferes, etc.

Shoeing of mules, donkeys and cattle is also indicated.

The diseases of the foot are also considered, general lameness, contracted heels, corns, laminitis, quittor, canker, seams, etc. A special chapter on the military horseshoeing completes this work.

The 237 plates that illustrate this new book add considerably to the understanding of the descriptions.

A. L.

THE VALUE OF PHYSICAL EXAMINATION AND CLINICAL DIAGNOSIS IN THE CONTROL OF TUBERCULOSIS IN CATTLE.

The above is the title of a paper presented by Prof. Veranus A. Moore, Director of the New York State Veterinary College, to the United States Live Stock Sanitary Association at Chicago, in December last, a copy of which was placed in our hands on Dr. Moore's return from the meeting, and which we have read with more than usual interest, because we were not in sympathy with what we thought the doctor advocated by the title of his paper; we feared that his one-time belief in the value of tuberculin had been shaken; but our reading of the paper has shown us that Dr. Moore stands just where he always has stood since we have known him, in his estimation of the value of tuberculin as a diagnostic agent in bovine tuberculosis. He says in so many words: "There is no question but that the tuberculin test applied to all herds and properly repeated with the slaughter of the reactors would be the quickest way to eradicate tuberculosis." But he also points out further on in his paper that: "It is because of existing conditions in the great dairy districts that it seems desirable to *add* to the more stringent methods that are being applied in a *few* herds some measure to eliminate from *all* herds the cows with recognizable tuberculosis of the lungs, intestines, uterus and udder." Dr. Moore believes that it is the recognizable cases that are the real *immediate* spreaders, and says: "Check the spread of the virus in every dairy herd, should be the slogan of the live-stock sanitarian." While the title of Dr Moore's paper includes under one heading physical examination and clinical diagnosis, he desires it clearly understood that these are not synonymous terms and should be carefully differentiated; he says: "The term 'physical examination' means the systematic study of the various parts of the animal body by means of the ordinary senses"; and "In applying this method, each system, such as the respiratory or circulatory, is carefully examined in every part possible, so that any deviation from

the normal at any point that can be reached by the human eye, hand or ear can be detected." That naturally raises the question as to whether or not "*any* deviation from the normal" can be detected, and we do not believe Dr. Moore means that to be taken literally, but rather that advanced abnormalities will naturally be detected on a careful physical examination by an experienced diagnostician. In fact, he covers just such a point further along in his paper, where he says: "The question naturally arises as to the degree of accuracy of such examinations in identifying any particular diseases"; and follows with: "It is clear that a careful examination of the subcutaneous lymph glands would indicate whether one or more of them was enlarged. It would be difficult, in fact impossible, from that indication alone to state the specific nature of the trouble. The same would hold with abnormal findings in other parts. If, however, the morbid changes are well advanced, they usually take on a form that is more or less characteristic of the disease they represent. This is not always true, for not infrequently diagnosis based on such findings proves to be erroneous. There are certain specific diseases, such as tuberculosis, actinomycosis, glanders and some others that can be identified in a very large percentage of cases, when the tissue changes have advanced to a certain stage." And our interpretation of Dr. Moore's paper is that it is the *advanced* cases of tuberculosis that he hopes to pick out from the herds by the system of physical examination that he advocates. And, as he says further on: "The degree of accuracy of such a diagnosis is necessarily determined by the knowledge possessed by the examiner of the course of the disease and the relative frequency of other causes, giving rise to apparently like conditions." Still further along he says: "The diagnosis therefore by physical examination in cases of specific diseases is presumptive. This presumptive diagnosis stands in exactly the same position as other presumptive tests employed in laboratory work." And after giving a number of examples in laboratory tests of water, milk, excreta, etc., the doctor continues: "In a like manner the presence of obvious tissue changes suggestive of tuberculosis

warrant the same degree of consideration as other presumptive tests, which are accepted as sufficient evidence for action." If we have gotten a correct understanding of Dr. Moore's paper, as suggested by the title and our reading of it, in his method for the removal of "recognizable cases" from the herd he does not tie himself down to physical examination, but also includes "clinical diagnosis," which he defines as: "The finding of morbid conditions on physical examination and identifying the disease by any means or test that may be applied to the living animal, such, for example, as microscopic examination of excreta, chemical analysis of secretions or specific reactions." He also adds further along: "It is well, therefore, to recognize that physical examination and clinical diagnosis may be like two variables gradually approaching the same limit." He faces the vital question: "To what extent can tuberculosis be controlled by the use of physical examination only?" and admits its very narrow limitations without confirmation by some of the methods included in clinical diagnosis, already referred to, and adds: "The physical examination in this country should include all that the Germans hope for by the clinical diagnosis. They find the suspicious case on physical examination, and then proceed with methods of precision to make a positive diagnosis. We should remove the suspicious cases, and if they are kept they should be held in quarantine until the positive diagnosis is made. If this were done, the physical examination here would mean all that the clinical diagnosis means in Germany. If this were applied to all herds, it would be a great addition to the present method in eliminating tuberculosis." This last paragraph is conclusive evidence that Dr. Moore is not tied up to the physical examination; he does not advocate taking anything away from our present method, but would add to it the elimination from all herds of the cases recognizable on physical examination as a preliminary measure, and he would follow that with all other means of detecting tuberculosis in cattle, including the tuberculin test. That, at least, is our interpretation of the paper, and is entirely in keeping with the scientific attainment of its learned

author; but what we cannot quite comprehend is, how it is to be accomplished. We will take, for example, the State of New York, where, we understand, such a system has been recommended at a recent conference on tuberculosis as expedient, and will in all probability be offered as an amendment to the present agricultural law. There are in New York State about one million eight hundred thousand milch cows and about nine hundred thousand other cattle; the physical examination of which, even in the most superficial manner, would require the services of a very large force of veterinarians for a considerable time; and to make a careful and thorough examination of them, such as Dr. Moore recommends (and as it should be done, if done at all), will require still longer, to say nothing of the methods of precision that are to follow. Dr. Moore concludes his paper as follows: "It is important to recognize always where the value of a physical examination begins and ends. The following seems to be determined: 1. A physical examination will enable a skilled examiner to detect advanced cases of tuberculosis in cattle. 2. It will enable one to detect the presence of lesions in less advanced cases, so that the *suspicious animals* can be removed. 3. The physical examination will not detect more than from 1 to 5 per cent. of the infected animals at one time. For this reason its value is very largely restricted to the intra-herd control of the disease. 4. A physical examination cannot be relied upon to detect all infected cattle, and consequently it is of little value in inter-herd control. For this protection tuberculin is the only diagnostic agent we have. 5. Finally, a physical examination will detect, if properly carried out, from 80 to 90 per cent. of the animals which are actually spreading the virus."

THE TURN OF THE TIDE FOR A GREAT VICTORY; THE ARMY VETERINARY BILL WILL WIN.

Important and encouraging news! The Army Veterinary Bill passed the Lower House of Congress unanimously on Jan-

uary the sixth. This successfully finishes the second reading of the bill, as the favorable report on it by the House Committee on Military Affairs, April 26, 1912, constitutes its first reading. Now let the dynamic energy of the whole profession come into play for the task of pushing the measure through the Senate. Towards the close of our editorial on this subject in the January number of the REVIEW we said: "The whole profession will soon be called upon to rally for the bill and it will leap to the call." Earnestly, confidently, we issue the call for every veterinary organization, every loyal veterinarian to get into the scrimmage that we may now carry this measure to its victorious goal. The news that this legislation is two-thirds won will go through the profession like a running fire. The electric force which it will create will reach such a voltage that nothing can stand its strength. It must irresistibly break down whatever small remnant of opposition there may by chance be in the Senate—if there be any at all. The work of the newly encouraged, bestirred and energized profession is now to carry by a single-hearted united effort the Army Veterinary Bill through the Senate and thus set at rest forever the opprobrious opinion that ours should be a profession outside the pale and below other professions in the Army.

How do we stand in the Senate? What work already has been done therein for this bill? What are the chances of final success for this legislation in the third and last reading by the Senate and a vote which will pass the measure before March the fourth?

By midsummer 1912 about fifty Senators had committed themselves to favor the bill, and during the last ten days of the second session of the Sixty-second Congress, closing last August, such additional support had been promised that, had we not at that time failed in the House, our bill surely would have passed the Senate. We have lost no ground in the Senate since last August; instead of that we have been extending our influence. The expectation is that we will surely win in that body when the

bill comes to a vote on the floor. There is, almost without exception, concurrence of the Senate on bills, such as ours is, when the House Committees favor any such bill and when the vote in the House is overwhelmingly for it. That our bill has received the unqualified endorsement of the Lower House in the unanimity of its vote goes a very long way to mollify any qualms tending to oppose it in the Senate and to make it triumphant in that Upper House. We may, therefore, work with strong hearts and unflinching zeal for passage of the bill through the Senate, having the assurance that our doggedness has a reasonable basis and that the concurrence of the Senate in the action of the House of Representatives not only is to be hoped for but to be expected.

Two things remain to be done; first, to bring the most potent influences to bear upon the chairman and members of the Senate Military Committee to cause them to report out favorably the bill to the Senate as a whole; second, to persuade every Senator to favor the bill, to agree to vote for it when it comes up for a vote on the floor of the Senate, and to actively work among his coterie of friends in the Senate that all may be induced to approve the bill. Chairman Hoskins has been working for a hearing of our professional representatives before the whole Senate Military Committee, to the end that that committee shall favorably report out the bill. This may happen any day. The time is exceedingly short before the close of Congress, March the third, and is full of danger. Procrastination is perilous. If the bill has not passed the Senate by the time the February REVIEW gets to our readers' hands they will make no mistake in urging their Senators to work for our measure, known as S. 5792, "A Bill to Consolidate the Veterinary Service, U. S. Army, and Increase Its Efficiency." The time for action being short is precious. But time, as one of the celebrated writers has said, is not measured by fingers on a dial, but by heart throbs. The hearts of all veterinarians devoted to professional advancement will find strength in the impending happy consummation, after many years of toil, in victory at last for the Army Veterinary Bill.

BETTER ORGANIZATION FOR STATE LIVE STOCK SANITARY CONTROL WORK.

In our February number one year ago, in publishing some notes on the meeting of the Minnesota Veterinary Medical Association, which had been held the previous month, we referred to the evidence of progression, and expansion in importance, of the Minnesota Association in relation to the live-stock industry of the state; and it would seem that the "Minnesota Plan" of organization for State Live Stock Sanitary Control Work is becoming generally recognized and is attracting the attention of other states, some of which have already organized along similar lines, and another contemplates doing so. This last one has been brought about, largely, by an address made by Prof. M. H. Reynolds, of the University of Minnesota, member of the State Live Stock Sanitary Board, before the Kansas Veterinary Medical Association, at its meeting in Topeka, January 7 and 8. The Kansas association gave a considerable amount of time to the consideration of better organization of state live-stock sanitary control work, especially on account of the recent epizootic among horses in that state; and by special arrangement Prof. Reynolds gave an address on "Fundamentals of State Live Stock Sanitary Control Work." The State Live Stock Breeders' Association, which was in session in Topeka at the same time, invited Dr. Reynolds to come over to their meeting and repeat the address for their benefit. Dr. Reynolds complied; with the result that the two organizations, each appointed a committee to cooperate for the purpose of securing from the present legislature a good State Live Stock Sanitary Association with a suitable appropriation. What has come to be known as the Minnesota plan was organized in that state something like ten years ago by Reynolds, and has since been adopted by North Dakota and several other states, and we understand that Kansas proposes to accept a suggestion for a further improvement of that plan by having a majority or possibly all of the board members ex-officio representing the State Live Stock Breeders' Association,

State Dairyman's Association, Agricultural College and Experiment Station, State Veterinary Medical Association, etc., rather than take the chance of political appointees. In our last month's edition of the REVIEW we referred to the ninth annual report of the Minnesota Live Stock Sanitary Board, and may add that the accomplished work reported therein is something that any state might be proud of.

The following paragraph extracted from the report on glanders indicates pretty clearly that they have that disease under control in Minnesota:

"Owing to the requirements of North and South Dakota, Montana, Iowa, Wisconsin and Canada, compelling all importations of horses to be accompanied by a mallein test chart, certifying that animals are free from glanders, over 6,644 horses were mallein tested, of which number 20 reacted and were later retested, appraised and slaughtered on request of owners."

If such percentages of reactors prevailed in all states, our country would be practically ridded of one of the most deadly scourges that horse flesh is heir to. At least it would be under control.

MUST DO FIELD WORK BEFORE RECEIVING DEGREE—At the last moment, after our forms were all made up, we received from the Iowa State College, about a page and a half of matter, relative to a plan for giving to the candidates for the degree of veterinary medicine, two weeks of practical training in the field, either of general practice or the meat inspection service, according to which of the fields the candidate expects to enter upon receiving his degree.

Arrangements just completed by President R. A. Pearson, will make it possible for students to go to Omaha, accompanied by Prof. Dimock and do practical work in the abbatoirs, and attend lectures in the evenings on different phases of the work. Others who expect to enter general practice, will be apportioned among the leading veterinarians of the state. After this practical course, they return to the college for graduation. We regret that our space does not admit of the interesting details.

ORIGINAL ARTICLES.

FORAGE POISONING OR CEREBRO-SPINAL MENINGITIS.*

By J. R. Mohler, Chief, Pathological Division, B. A. I., Washington, D. C.

Introduction.—About one hundred years ago (1813) there appeared in Würtemburg a fatal disease of horses which was termed "head disease," owing to the pronounced manifestation of brain symptoms. The affection spread through certain sections of Europe from 1824 to 1828 and was described as "fever of the nerves." In 1878 the attention of the veterinarians of Saxony was attracted to the disease which was then termed "nervous sickness," and within the next ten years it assumed an epizootic character. In fact the malady became so prevalent in and around Borna during the 90's that it became known as the Borna disease. The affection had spread like a plague on two occasions in Belgium, and has also exacted a heavy toll in Russia, Great Britain, Austria, Hungary and elsewhere. Its appearance in America is by no means of recent occurrence, for the affection was reported by Large in 1847 and by Liautard in 1869 as appearing in both sporadic and enzootic form in several of the eastern states. Since then the disease has occurred periodically in many of our states in all sections of the country, and has been the subject of numerous investigations and publications by a number of the leading men of our profession. It is prevalent with more or less severity every year in certain parts of the United States, and this year the Bureau has received urgent requests for help from Louisiana, Georgia, South Carolina, South Dakota, North Carolina, Kentucky, Texas, Virginia,

* Presented to the thirtieth anniversary of the Illinois Veterinary Medical Association, Chicago, December, 1912, and with slight modifications at the thirtieth anniversary of the Pennsylvania State Veterinary Medical Association, Harrisburg, January, 1913.

Maryland, New Jersey, West Virginia, Oregon, Kansas, Nebraska, Colorado, Missouri and Iowa. While this year the brunt of the disease seemed to fall on Kansas and Nebraska, other states have been seriously afflicted. In previous years, for instance, in 1882 as well as in 1897 the horses of southwestern Texas were reported to have died by the thousand, and in the following year the horses of Iowa were said to have "died like rats." However, Kansas seems to have had more than her share of this trouble, as a severe outbreak that extended over almost the entire state occurred in 1891, while in 1902 and again in 1906 the disease recurred with equal severity in various portions of the state.

Nomenclature.—There have always been considerable discussion and criticism regarding the different names which have been given this malady, and various terms have been applied according as each author in past outbreaks has considered certain symptoms or lesions as the paramount feature of the affection. Thus the disease has been termed cramp of the neck, head disease, mad staggers, sleepy staggers, etc. Through the recent investigations of Grimm, Schmidt, and others, it has been quite definitely established that "head disease," Borna disease and cerebro-spinal meningitis are one and the same, and Hutyra and Marek have accepted this opinion and incorporated it in their Special Pathology. While at first the Borna disease was considered as a form of cerebro-spinal meningitis, the work of Johne and Ostertag (1900) indicated that it was an independent disease because they failed to find any inflammatory changes in the central nervous system. Accepting this view, Friedberger and Fröhner have separated the two diseases in their Theory and Practice, basing their differential diagnosis chiefly on the absence of inflammation in the brain and cord of Borna's disease. However, since the publication of this excellent work in 1904, Oppenheim, Dexler, Schmidt and others have shown conclusively that inflammatory lesions are present in the central nervous system, although Dexler has pointed out that in some cases it is necessary to make a systematic examination of a number of slides to dis-

cover the inflammatory changes. As a result the more recent writers have adopted the viewpoint that the two terms, Borna disease and cerebro-spinal meningitis, are synonymous. When this disease appeared with such severity in certain sections of the United States last summer there were a number of persons who claimed that it was the Borna disease appearing in the new world for the first time; others diagnosed it as a new horse disease, as influenza, parasitism (due to the palisade worm), paralysis similar to poliomyelitis (infantile paralysis) of man, epidemic cerebro-spinal meningitis of man, and equine malaria from the fact that mosquitoes were prevalent and the horses were in lowlands. Fortunately for our profession, these erroneous diagnoses while participated in to a certain extent by some veterinarians, were usually the opinion of physicians, chemists, bacteriologists, who were not veterinarians, and others of limited veterinary experience. However, the vast majority of veterinary practitioners recognized the disease as their old torment, cerebro-spinal meningitis, staggers or forage poisoning. The latter name came into the literature of the disease as a synonym in 1900 following the investigation of an outbreak by Pearson. He was able to reproduce the disease in experiment horses by feeding them on damaged ensilage, and by giving them water to drink which had percolated through this silage. Doubtless influenced by the frequent absence of macroscopic lesions of the central nervous system, and by the analogy between this disease and meat poisoning of man, Pearson proposed the name forage poisoning which has been more or less in favor ever since. There are certain objections to this term, principally from the fact that it may suggest a form of poisoning produced by vegetation that is specifically poisonous, such as lupines, loco, larkspur, etc., or by ordinary forage that is poisonous of itself. This, however, was not the intent of Pearson, for by his analogy to meat poisoning it is evident that he did not wish to convey the impression that all forage was poisonous any more than all meat is poisonous. But when meat becomes contaminated with pathogenic bacteria, such as the Bacillus enteritidis, Bacillus

botulinis, etc., such meat is dangerous to man in the same manner that ordinary forage contaminated with certain unknown infective agents becomes dangerous to horses and produces forage poisoning. In other words, the forage is the carrier and not the primary factor in the disease. On the other hand, this term had a direct advantage in being readily understood by our clients and in conveying to the laymen's mind that an absolute change in feed is essential. After years of study and experimentation it is the consensus of opinion of practically all workers that the disease can be controlled effectively only by a total change of feed and forage, in other words, by preventive measures and not by medicinal treatment. That there is direct connection between the ingestion of green forage, exposed pasturage, newly cut hay and fodder, and the development of the disease is quite obvious, and that the ingestion of such forage when contaminated is the most important factor is equally obvious, as almost 100 per cent. of the cases in Kansas and over 95 per cent. of the cases in Nebraska of which we have any record were maintained all or part of the time under such conditions. Even such negative history is not always dependable, as the owner on one farm informed me positively that the dead horses had eaten nothing except old hay and grain, but when I noticed the closely cropped grass in an adjacent pasture, he innocently remarked that he always turned the work horses into the pasture over night. In fact in some sections it has been termed the "pasture disease."

Other names which have given to this affection are epizootic encephalomyelitis, meningo-encephalitis and meningomyelitis, enzootic cerebritis, leuco-encephalitis, etc., but personally I prefer the old-fashioned terms cerebro-spinal meningitis for the scientific term and blind staggers for the lay term. That the symptom of staggering is one of the most common manifestations of the disease is shown by the clinical observations of Schmidt who has made a close study of 415 cases, 377 of which developed staggering symptoms while standing or walking. The only symptom which occurred more frequently was the loss of appetite

appearing in 410 animals, while the symptoms next in prominence were grinding of the teeth which was observed in 349 cases, and difficulty in swallowing which occured in 335 cases.

Etiology.—Unfortunately no specific bacteria, fungus, virus, or other toxic principle has yet been found which can be considered as the cause of cerebro-spinal meningitis in the horse. It is quite true that bacteriological investigation has given us a number of different organisms by an equal number of different investigators, each of whom has thought his particular organism to be the causative agent of the disease, but the fact remains that the four rules laid down by Koch have not been met with sufficient regularity to make the results satisfactory to the disinterested worker. Further investigations are necessary to decide which, if any, of the reported organisms is the true cause of the disease. That the disease may not have an etiological entity has been suggested by Weichselbaum, Hutyra and Marek. This would seem quite probable if all the claims for the following different etiological factors were to be accepted. For instance, Siedamgrotsky and Schlegel incriminated a micrococcus as the cause of the disease. On the other hand, Johne found diplococci in the cerebro-spinal fluid which he termed diplococcus intercellularis equi. Again Ostertag recovered streptococci in short chains from the blood, liver, urine and brain of affected horses. These organisms he termed Borna streptococci. Harrison, of Canada, isolated a streptococcus from the brains of horses affected with cerebro-spinal meningitis which was quite similar to Ostertag's, although it differed in forming capsules, staining by Gram's method, refusing to grow well on gelatin and in proving virulent for laboratory animals. In Minnesota, Wilson and Brimhall have also incriminated a diplococcus as the cause of cerebro-spinal meningitis of horses, cattle, sheep and pigs, and proved it to be the diplococcus pneumonia of Frankel. They likewise claimed to have isolated the micrococcus intercellularis meningitidis of Weichselbaum from the central nervous system of a cow showing symptoms of spinal meningitis. This latter organism is also reported to have been found by Christina in

primary sporadic meningitis in the horse and in a goat. The remarkable part of all the above investigations is that each author considers his particular organism as the etiological factor of the disease and the majority of these writers believe they have succeeded in producing the disease in horses by the inoculation of these differing agents. Some of these positive results are readily explained by the large quantity of turbid fluid injected under the dura. The inoculation of 5 and 10 c.c. doses of a heavy emulsion of any organism is likely to produce a headache in a horse or elephant for that matter, and the irritation set up by such a foreign material will necessarily produce exudation with accompanying mechanical pressure, so that it is not surprising to read in the post-mortem notes of some of these cases that the meninges bulged through the opening on cutting through the bones of the skull. Schmidt, of Dresden, is of the opinion that the nature of the infectious principle is not settled, and believes that the cocci and diplococci which have been ascribed as causative factors will in the future be deprived of their pathogenic relationship. Grimm, working in Zwick's laboratory in Berlin, isolated streptococci from horses affected with head disease or staggers which were not essentially different from the Borna streptococci of Ostertag. Owing to the regularity with which these cocci were taken from the brains of horses with "head disease," cocci which Grimm states possessed slight, if any, properties necessary to make them causal factors of disease, the question arose whether the same microorganisms are not also found in the brains of healthy horses. Grimm obtained the heads of 10 horses which were killed at the Zoological Garden for the animals, and which were by examination found to be free from any indication of cerebro-spinal meningitis. In the brains of these healthy horses he found cocci (staphylococci and streptococci), although cultures were made within a few hours after death, and at least one strain has shown many similarities to the streptococcus found by Ostertag. These results are very similar to the results of the Bureau. In horses which have died of forage poisoning it is not a difficult task to

recover various forms of cocci, in fact too many forms to make them all of etiological significance, while in those cases which have been killed in the late stages of the disease it is of common occurrence to have all the culture media inoculated with the various tissue remain sterile. On the other hand, we found micrococci, diplococci, streptococci and staphylococci so frequently in the brains of horses which have died of dourine, swamp fever, influenza, etc., that we have come to consider these organisms as representing an agonal invasion from the intestines without causal connection with any definite disease. Like Grimm, we have found some of these same cocci in the brains of horses that died of forage poisoning, and we have also recovered other species, all of which have been inoculated into experiment horses by various methods, including intravenous, subcutaneous, subdural and intralumbar injection as well as by spraying the nasal mucous membrane, with the result that two horses died following a nasal douche and a subdural injection respectively of a pure culture of two different cocci. The post-mortem on the former showed death to have been due to a strangulated intestine, while the second animal died suddenly without evincing any characteristic symptoms, although extremely nervous. Post-mortem examination showed an absence of any pathological lesions posterior to the brain. The dura mater was inflamed and distended with a yellowish exudate. The veins and capillaries of the cerebrum were dilated and engorged with blood while the third ventricle contained a cholesteatoma the size of a walnut. While the same organism which was injected was recovered from the brain tissue other horses injected with the recovered culture have continued to remain in a healthy condition. With the view of obtaining additional information regarding the significance of these various cocci to the disease in question, an antigen was prepared from a culture of each organism and tested against the blood serum obtained from affected horses in the field for complement fixation and agglutination as in glanders. In no case was a positive reaction to these tests obtained by the use of any of the antigens prepared from the different cocci isolated from diseased

horses. In this connection it may be noted that from the number of affections of the horse produced by coccoid organisms, this animal appears to be particularly susceptible to their action. In two outbreaks of forage poisoning investigated by Moore of Cornell, one gave him negative results from a bacteriological standpoint, while in the other pure cultures of the colon bacillus were obtained from the brain.

Another cause has been suggested for this disease in the finding of nuclear inclusions by Joest and Degen in the nerve cells of the hippocampus. These inclusions are similar to the Negri bodies of rabies, and are rounded or oval in shape, staining intensely with eosin. A large number of brains from affected horses have been examined in our laboratory for these bodies, but thus far with negative results, although the same technique applied to the brains of rabid animals brings out the Negri bodies with great clearness. There remains one widely accepted theory as to the causation of the disease which must be given consideration, namely, fungi on the feed. While most investigators have obtained negative results when feeding experiment animals upon moldy feed, some few have reproduced the disease by such feeding. Thus Mayo reports that a colt fed experimentally upon some of the moldy corn, which was held responsible for the serious outbreak in Kansas in 1890, developed the disease and died on the twenty-sixth day. Again the Kansas outbreak of 1906 was said by Haslam to have been produced by immature ears of corn infected by molds, although the exact mold was not discovered. By feeding horses upon this immature corn badly infected with molds, typical fatal cases of staggers were produced in four out of seven horses. Haslam also records the fact that severe losses of horses have occurred in other states when the grasses in the pastures become moldy. Klimmer commenting upon the negative results obtained in experiments with moldy feed asserts that the numerous losses occuring from the feeding of such material indicates the probability that the experiments were not sufficiently extensive from which to draw conclusions, and believes that the use of such feed should be discouraged.

Among other writers who have attributed the disease to toxic fungi are Michener, Trumbower and Harbaugh. The latter investigated the serious outbreak of this disease which occurred in Virginia and North Carolina in 1886, and claimed that every case of the disease could be traced directly to moldy feed. This theory of toxic fungi is not antagonistic to the facts in many of the best observed outbreaks, and knowing that fungi vary greatly in growth and in the elimination of various products under different climatic conditions, we may explain the irregularity of the symptoms as well as the occurrence of the disease under what may appear to be identical conditions. Thus Ceni, of Italy, states that molds are capable of producing poisons, but only at certain stages of their growth, and at other times they are entirely inactive. A case of this character was investigated by the Bureau several years ago in an outbreak among the army horses at an encampment in Pennsylvania. Many horses had died of cerebro-spinal meningitis as a result of eating moldy baled hay, and as soon as the hay was eliminated the deaths ceased. Other horses in the vicinity not fed upon this hay failed to contract the disease. At the suggestion of State Veterinarian Marshall the bales were opened and exposed to the sun for three or four weeks, after which time this hay was fed sparingly at first and later in usual quantities without producing any ill effect. Forage poisoning, therefore, seems to be an autointoxication rather than an infection and due to certain chemical poisons or toxins formed by organismal activity. These toxins may be present when the forage is taken into the body or formed in the gastro-intestinal canal and therefore the disease is a specific form of autointoxication. The nature of the substance which causes these harmful changes or the poisonous bodies that are formed remain unknown.

On account of this very old and very plausible theory so often advanced that the disease is due to toxic substances existing in damaged grain and fodder, a number of species of fungus were isolated during the past year from damaged corn and forage and grown on a sterilized corn medium or alfalfa infusion in

an effort to produce some toxic substance that would create disease when fed to horses. The pure cultures were allowed to grow for periods of one month's duration, in flasks containing 250 cubic centimeters of the nutrient medium and the contents of one flask was fed each day for a period of 30 days along with a sufficient quantity of sound corn and hay to make a normal ration, but no symptoms have thus far developed in the experiment animals, although only about one-half of the number of pure cultures isolated have thus far been used in this experiment.

It is possible that laboratory conditions alone cannot be made to parallel sufficiently close those which exist naturally in the growing plants and that toxic substances which might be produced in a natural state would not be generated in a corn meal medium in the laboratory. The by-products of the growth of both fungi and bacteria on corn and forage should certainly receive more consideration in future work. In view of the above information it must appear to the unbiased mind that the cause of forage poisoning remains an obscure and puzzling problem.

Occurrence.—Like cerebro-spinal meningitis of man, forage poisoning occurs in sporadic as well as enzootic and epizootic forms. The sporadic cases occur either in different localities from the epizootic outbreaks or in such sparse numbers as not to amount to an enzootic. Thus the outbreaks are quite variable in extent and severity. Sometimes it becomes very widespread, causing heavy losses, as in the recent outbreak in Kansas and Nebraska, while at other times there are only sporadic cases. Liebener believes that the development of the cause of the disease in Germany is favored by the rainfalls and warmth of the earth during summer and autumn. No conclusive evidence has ever been presented to indicate that the disease is ever transmitted directly from one horse to another. Sick animals have been placed alongside of susceptible horses in the same stable without conveying the disease to the latter and healthy horses have been placed in stalls previously occupied by animals which died of the disease, and have eaten from the same mangers without previous disinfection, but in no case has the disease been

transmitted in this manner. In the recent outbreak it was quite noticeable that livery and other work horses were not affected so long as they were fed on clean, dry forage, although they were constantly exposed to the disease by coming in contact with diseased horses. For instance, Dr. Busman, who was in charge of the Kansas field force of veterinarians, reports a case where horses were kept in adjoining corrals separated only by a wire fence. Those on one side were fed on green forage and recently cut cane and died from the disease, while those on the other side were fed dry feed and not one became sick. He also reports a similar occurrence in a livery barn where the horses had been fed on clean, dry feed without sickness, but when fresh cut bottom-land hay was substituted for the former feed the horses became sick within a few days. Another similar instance was reported by Davison, in charge of the field force in Nebraska, in the case of a farmer who owned a work team that was strictly barn fed. While attending the State Fair at Lincoln these horses were turned out on pasture for two days and both horses came down with the disease on the fourth and fifth day respectively after being taken off the pasture. It is such cases as these which have incriminated the forage and caused the disease to be known as "pasture disease" in some localities. Indeed some veterinarians report that all the animals affected had been on pasture, or having been removed from pasture, had been fed on recent cuttings of alfalfa, prairie hay, cane or kaffir corn, while no cases came under observation where the animals had been on dry feed all summer. A long period of dry weather followed by rainfall with considerable humidity and heat seems to favor the development and dissemination of the disease. The period from August 1 to October 1, 1912, presented exceptional climatic conditions in western Kansas and southern Nebraska, and it was observed that crops cut and cured before this date could be fed with impunity. During the first week in August a heavy rainfall started in Kansas and nearly twice the usual amount was recorded, mostly falling during the night and soaking in. This was followed by very high temperatures, the seventeen days from

August 23 to September 9 being the hottest series of days on record in Dodge City. There were also more than the usual number of cloudy or partly cloudy days with high relative humidities. The dew point was reached early at night and the deposit of dew was abundant, which is uncommon in that section. High humidities certainly continued throughout the day among the grasses near the soil. These grasses, which usually cure into hay on the root, became dotted with both parasitic and saprophytic fungi. Water holes, draws and buffalo wallows remained filled with water throughout most of the period. During the latter part of September frosts occurred accompanied not only by cooler weather but with lower humidity which are the significant factors in the subsidence of the disease, and after the first week in October the disease practically disappeared. Since then many owners have placed their horses back on the same pastures used during the serious stages of the disease and there has been no ill effects noted. This would indicate that there are good reasons to believe that the forage is no longer in condition to produce the disease and hence its use is safe, as in the case of the Pennsylvania baled hay previously mentioned. Somewhat similar conditions of climate obtained in Nebraska during the prevalence of the disease, but on September 25 a killing frost was recorded followed by several light frosts and a reduction in the relative humidity. After this time the disease rapidly subsided and finally disappeared. There is not much question but that some of this infected forage has been baled and shipped to various points, and it is therefore not unlikely that sporadic cases of the disease will appear in these sections under favorable climatic conditions. In this connection, attention should be called to the marked prevalence last summer and fall of the disease of cattle known as mycotic stomatitis which simulates the foot-and-mouth disease of Europe and is caused also by contaminated forage. This disease first appeared in Florida and spread over Georgia, North and South Carolina, Tennessee, Kentucky, Virginia, Maryland and into Pennsylvania. The climatic conditions were evidently appropriate for the development of the causative agent

on the forage, and as soon as the animals were brought out of the pastures and stall fed, the disease immediately subsided.

Symptoms and Lesions.—In most of the cases disturbance of the appetite, depression and weakness are the first manifestations observed, although all the symptoms vary within wide limits. This feature of the disease has been so ably presented by Reichel in the October number of Mulford's *Veterinary Bulletin,* by Campbell in the October number of the *Journal of Veterinary Medicine,* and Kinsley in the November number of the AMERICAN VETERINARY REVIEW, that I shall pass over the subject briefly.

Very soon the real symptoms of the disease appear. There is trouble in swallowing, drooping of the head and sleepiness which may give way to excitement and attacks of vertigo. An impairment of vision is noted with loss of co-ordination, resulting in a staggering gait or reeling while standing. There is muscular twitching, cramp of certain muscles, chiefly of the neck and flanks, and grinding of the teeth. Sometimes colicky pains are noted. If in an open space, the animal will walk in a circle, sometimes to the right, at other times to the left, and will try to push through any obstacle with which he comes in contact. In the stable he will press his head against the stall or rest it on the manger. Sometimes he will crowd backwards or sideways until he gets in a corner and remains there. If the temperature is taken at the beginning of the disease it will be found to be from 103 to 107 degrees Fahrenheit, but within 24 hours the temperature gradually falls until it reaches normal and then becomes subnormal. The pulse is from 40 to 90 and weak, while the respirations are fluctuating from normal to as high as 48 per minute. There may or may not be drooling of saliva, depending on the extent of the paralysis of the pharynx. The animal is often down on the second or third day and may or may not get up when urged to do so. While down he will go through automatic-like movements of pacing or walking, resulting in acceleration of the pulse and respiration. At this time the legs are held out stiffly and parallel to the ground. The hind legs of many

of these animals that have gone down are paralyzed and there is loss of sensation of the skin of these parts. The expired air is extremely fetid and there may be a croupous-like deposit of the throat which has caused the name "putrid sore throat." The conjunctiva may show injected blood vessels or petechiae on a yellowish tinted background. Coma or somnolence may be marked in those animals going down within the first few days. Those which remain standing may become violent or delirious, but ordinarily the horse is tractable and easily managed. Death usually occurs in from four to eight days, although in the acute form death may follow within 10 or 12 hours after the first symptoms are observed, while in the chronic cases the disease may last two or three weeks. The prognosis is very unfavorable, as 85 to 90 per cent. of the affected animals died in the beginning of the outbreak, but later the cases became milder with a consequent drop in the mortality.

On post-mortem the amount of lesions observable to the naked eye is in marked contrast to the severity of the symptoms noted. The pharynx and larynx are inflamed in many cases, and sometimes coated with a yellowish white glutinous deposit, extending at times over the tongue and occasionally a little way down the trachea. The lungs are normal, except from complications following drenching or recumbence for a long period. The heart is usually normal in appearance, except an occasional cluster of petechiae on the epicardium, while the blood is dark and firmly coagulated. The mucosa of the stomach indicated a sub-acute gastritis, while occasionally an erosion is noted. An edematous, gelatinous infiltration is observed in the submucosa of such cases. The first few inches of the small intestines likewise may show slight inflammation in certain cases, while in others it is quite severe; otherwise the digestive tract appears normal, excluding the presence of varying numbers of bots, strongylus vulgatus and a few other nematodes. The liver is congested and swollen in some cases, while it appears normal in others. The spleen is, as a rule, normal and at times the kidneys are slightly congested. The bladder is often distended with dark colored urine, and oc-

casionally a marked cystitis has been observed. The adipose tissue throughout the carcass may show a pronounced icteric appearance in certain cases. On removing the bones of the skull the brain appears to be normal macroscopically in a few instances, but in most cases the veins and capillaries of the meninges of the cerebrum, cerebellum and occasionally the medulla are distinctly dilated and engorged, and in a few cases there are pronounced lesions of a leptomeningitis. An excessive amount of cerebro-spinal fluid is present in most of the cases. On the floor of the lateral ventricles of several brains there was noted a slight softening due to hemorrhages into the brain substance. There is always an abundance of fluid in the subarachnoid spaces, ventricles and at the base of the brain, usually of the color of diabetic urine, and containing a limited amount of flocculi, but in a few cases it was slightly blood-tinged. The spinal cord was not found involved in the few cases examined.

A comparative microscopic examination of the brains of horses which died in Kansas, New Jersey, Maryland and Virginia this year with those of horses from previous outbreaks showed the same characteristic perivascular round-cell infiltration, especially in the olfactory lobe and the hippocampus. The piameter showed an increased amount of connective tissue with dense round-cell infiltration which extended into the adjacent cortical portion of the cerebrum. The capillary blood vessels were engorged with cells and their walls were greatly infiltrated. Limited areas of leucocytic infiltration and small hemorrhages in the brain tissue were not infrequently observed. No cellular inclusions in the ganglionic cells were detected after prolonged examination.

Treatment.—One attack of the disease does not confer immunity. Horses have been observed which have recovered from two attacks, and still others that recovered from the first attack but died as a result of the second attack.

Inasmuch as a natural immunity does not appear after an attack of cerebro-spinal meningitis, it might be anticipated that

serum of recovered cases would possess neither curative nor prophylactic qualities. Nevertheless experiments were made along these lines with serum from recovered cases, but without any positive results. Similar investigations have been conducted by others in Europe with precisely the same results. With the tendency of the disease to produce pathological lesions in the central nervous system, it seems scarcely imaginable that a medicinal remedy will be found to heal these foci, and even where recovery takes place there is likely to remain some considerable disturbance in the functions, as blindness, partial paralysis, dumbness, etc. Indeed when the disease once becomes established in an animal drugs seem to lose their physiological action. Therefore, with all the previously mentioned facts before us it is evident that the first principle in the treatment of this disease is prevention, which consists in the exercise of proper care in feeding only clean, well cured forage and grain and pure water from an uncontaminated source. These measures when faithfully carried out check the development of additional cases of the disease upon the affected premises. While medicinal treatment has proved unsatisfactory in the vast majority of cases, nevertheless the first indication is to clean out the digestive tract thoroughly, and to accomplish this prompt measures must be used early in the disease. Active and concentrated remedies should be given preferably subcutaneously or intravenously owing to the great difficulty in swallowing even in the early stages. Arecoline in one-half grain doses intravenously has given as much satisfaction as any. After purging the animal the treatment is mostly symptomatic. Intestinal disinfectants, particularly calomel, salol and salicylic acid have been recommended and mild antiseptic mouth washes are advisable. Anti-pyretics are of doubtful value, as better results are obtained if the temperature is high by copious cold water injections. An ice pack applied to the head is beneficial in case of marked psychic disturbance. One ounce doses of chloral hydrate per rectum should be given if the patient is violent or muscular spasms are severe. If the temperature becomes sub-

normal the animal should be warmly blanketed, and if much weakness is shown this should be combatted with stimulants such as strychnine, camphor, alcohol, atropine, or aromatic spirits of ammonia. During convalescence the usual tonic treatment is indicated. Many of the so-called "cures" made their reputation at the time the outbreak was abating and when non-interference was proved to be equally effective. One of the most unpleasant developments of the outbreak this year was the great amount of "faking" which seemed to be the only contagious feature connected with the disease. All kinds of drug specifics, serums and vaccines developed like mushrooms and were exploited in almost every community devastated by the disease. Many tainted dollars were obtained from the suffering horse owners who grasped at every newly advanced treatment like drowning men clutching at straws. One aged farmer who had a very fair idea of the disease himself said to the quack who had injected streptococcus, diplococcus, pneumococcus and several other bacterins into his horse: "Well, you have used all the kinds of remedies I ever heard of on old Nell but one and now you might as well inject her with cowpox vaccine." In Nebraska, blackleg vaccine was reported to be used as a preventive on at least 1,600 horses and nearly 1,500 of them are said to have died as a direct result of the vaccine. This feature is now being investigated by the government. Dr. Munn, of Kearney, Neb., had apparently good success from the use of diphtheria antitoxin as a prophylactic agent and not a single animal developed the disease out of over 500 injected. It may be with this treatment as with others that the good results were due to the fact that the disease was on the wane before treatment was commenced, but no other line of treatment gave as good *apparent* results. Dr. Kaupp also reports in the *Breeders' Gazette* that only one horse died of 900 inoculated with a diplo-streptococcic bacterin he prepared, but the injections were made so late in the outbreak that its value is still problematical since thousands of horses in the affected area at this period failed to develop the disease, although they had received no preventive treatment whatsoever.

A NEW FIELD OF ETIOLOGICAL RESEARCH OPENED BY SCHMIDT'S MIRACULOUS TREATMENT OF MILK FEVER IN COWS.—A NEW THEORY OF AZOTURIA IN THE HORSE.*

By John A. McLaughlin, D.V.S., New York, N. Y.

In the last few years a treatment has been discovered for milk fever in cows that infallibly cures that once fatal malady. It is probably the greatest discovery in therapeutics of this or any other age. Milk fever was (and is when not treated in this particular manner) the most generally fatal of any disease which attacks any species of animal, including man himself. The mortality previous to Schmidt's discovery was approximately one hundred per cent; now the recoveries are approximately one hundred per cent. (I believe the exact figures are ninety-eight per cent.) It is a genuine specific; its results are marvelous and bewildering. This is not the experience of one individual; it is the experience of all.

A treatment that is so uniformly successful under all circumstances must be extraordinary indeed, and too far out of the common to be relegated to the ordinary sphere of therapeutic measures; it must reach far beyond, deep into the very nature of the disease itself. I firmly believe could we but follow whither it leads we would find its termination in the very origin of milk fever itself, and the secret which has for so many centuries baffled all investigation would be ours at last. In this paper I propose to follow the treatment whither it leads as far as my light permits; if I fail in solving this riddle of the sphinx, I will be content, believing I have attempted its solution along those lines in which the riddle will be eventually solved.

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The history of this specific is as follows: A veterinarian named Schmidt conceived the idea that milk fever originated in the mammary gland. (The correctness of this idea marks Schmidt as a really great man, and I wish to do him reverence right here.) Schmidt originated a treatment, which has been modified somewhat, but has remained essentially the same in principle. It consisted originally of an aqueous solution of iodide of potash, one dram to the quart, injected into the mammary gland through its ducts. Schmidt's idea was that toxins originated in that gland, passed into the general circulation, producing the phenomena we name milk fever, parturient apoplexy, etc. Schmidt's mistake was in thinking toxins were formed in the gland, and that iodide of potash was the curative agent. It was soon found that any medicinal agent in solution was equally as efficacious as iodide of potash. Then oxygen was tried, and occupied the field for a short time. Oxygen was supposed to be superior as a germ destroyer and antitoxin; being a gas, it penetrated further into the ducts, even into their finest ramifications. The practical results seemed to justify its therapeutical application, for it proved a specific, but alas for its reputation as a superior therapeutical agent when another veterinarian, who was also a great man but a sorely perplexed one, forgot his oxygen tank one day, and in his extremity used a bicycle pump. The bicycle pump, forcing just common, ordinary, atmospheric air into the tubes, proved quite as much of a specific as oxygen. After this various syringes were patented or "patent applied for," which proved specific also. These syringes were all arranged with the idea that the air entering the ducts should be aseptic. (The aseptic part, I make free to say, was a failure.) It soon became apparent that asepsis had no part in the treatment, and its simplicity seemed to add mystery instead of enlightenment.

A few months ago another veterinarian, whose name, I regret to say, I forget, conceived the idea (diametrically the opposite to that conceived by Schmidt), that it was not a matter of germs, or toxins, or anything he could imagine, but that the disease

could be cured by almost anything. He tried some experiments along lines the very reverse of asepsis: he injected solutions, or rather, mixtures, into the udder containing stable sweepings which he swept off the floor—cow manure, sour milk, filth, etc.—in every instance curing the cow. In one experiment he removed a portion of the cow's skull and found the brain very anæmic; he then dilated the ducts and the blood returned to the brain and there was quite a hemorrhage. He killed this cow. It was certainly bold and original experimenting and it deserves high praise.

From this short synopsis of the history of the treatment of milk fever I think three points are made apparent: *First,* that the disease originates in the mammary gland; *second,* that local treatment cures it; *third,* that the results of the treatment do not depend in the slightest degree on the medicinal properties of the ingredients used, one agent being quite as efficacious as another, even when that other is as injurious a substance as cow manure, urine, or other filth.

Suppose we now take a typical case and apply Schmidt's treatment. A cow is quite suddenly attacked; when we arrive she is down, completely paralyzed and unconscious, cannot even swallow—in fact she is dying. A milking tube is inserted into the duct of each teat, and atmospheric air, oxygen, or a solution of iodide of potash, or some other medicinal agent, or a mixture of some agent that is the opposite of medicinal, like cow manure, urine, stable floor sweepings, sour milk, etc., is propelled with considerable force into the ducts. In a few hours, usually two to four, this dying cow is on her feet as well as ever.

This clinical history of a typical case of milk fever simply accentuates the wonderful results of the treatment, but it does not tell us its etiology. I have said, however, the treatment held the secret in its grasp, and I now propose to follow whither it leads.

The air, oxygen, or solutions or mixtures mentioned, has entered the ducts; it is forced far into them, to their terminal endings in their finest capillary ramifications. And then where?

In my opinion no further. Beyond the tubes is a slight amount of connective tissue, then the lacteal cells, then the blood vessels. If it enters the cells or blood vessels, then are my endeavors to solve the problem, to grasp its secret, futile, for if a mixture of cow manure, urine or other filth can, by entering the circulation, cure milk fever, or if curing, would not produce other and serious trouble, then am I astray in the very beginning of my investigation. A slight amount might enter the connective tissue, but no further, and this small amount must be injurious, retarding instead of advancing recovery. I am convinced the treatment does not pass beyond the tubes.

I have now followed the treatment whither it leads, from its beginning to its terminal. I first proved it was local, that it was confined in its influence to the mammary gland; now I have narrowed this sphere of influence to a part of the mammary gland. Within this small area does Schmidt's treatment infallibly cure milk fever; within the lacteal ducts does it perform this modern miracle of therapeutics. Has it yet given up its secret? Have we yet discovered the nature of milk fever? I think so. Positively we are in possession of one fact (else all that has gone before is error). Milk fever is intimately connected with the lacteal tubes. Pursuing our study from this point onward, we find ourselves immediately confronted with two alternatives: *First,* it is caused by something in the tubes but foreign to them; or *second*, something is wrong with the tubes themselves.

Between these two alternatives I choose to discard the former and accept the latter. I discard the former because I cannot imagine a mixture containng filth of all sorts *invariably* curing a fatal malady by its action in the tubes any more than I can imagine it curing the same malady by its action in the circulation. To believe so would be destructive of every recognized theory in medicine. If it is a germ, filth could only cultivate and multiply it; if an abraided surface, it would assuredly set up sepsis; there is nothing I can imagine that might exist within the tubes, or, for that matter, without, that such treatment would benefit in the slightest degree; therefore I discard it without any reservation whatever.

I accept the second alternative as unreservedly as I discard the former, and my reasons for accepting it are as follows: The tubes, as we are aware, are but passive factors in the production of milk, but because passive are none the less important; they receive the milk after it is manufactured; if they should by an accident or some other cause be unable to receive the milk, the lacteal cells, having no outlet for their product, would necessarily be arrested in their function of producing milk, and simultaneously cease removing those products from the blood from which they manufacture milk, with the result that these products in the blood, still being produced, would accumulate in the circulation. I express my conviction that an accident has happened to the tubes, that the accident is of such a character it could be duplicated if the cow herself was a man-made machine and the ducts the only outlet; that it is *purely mechanical in its nature* and no more a disease than a broken leg, and the symptoms no more the result of a micro-organism, a toxin, or an auto-infection, than are the evolutions of a "winged" bird as it falls to earth; that it is an accident that might happen to any set of tubes made of soft tissue inside the body or outside; that *they have simply refused to open;* that all the phenomena occurring, including its generally fatal results, are due to a very simple cause—a simple closing of the tubes.

The question which now confronts me is, what causes the tubes to close? As far as I can conceive, it may be due to three causes: *First,* over-distention; *second,* pressure from the engorged blood vessels; *third,* a glueing together of their walls by some plastic material after they have been emptied by the act of milking. Back of all these and all other reasons, however, is the overwhelming fact that the mammary gland of the domesticated cow is an abnormal gland. Intended by nature to supply milk for one calf (occasionally two), it is bred wholly for commercial purposes, and has been so bred for centuries. It seems strange that with such a history it has never been conceived that the gland might happen with an accident, either such as I have described or some other, as the horse bred for racing may rupture

a tendon by simple extension, an impossible feat for an underbred one to perform.

I have now followed the treatment to its terminal and the disease to its beginning; both meet at the same place. The treatment found itself confronted with closed tubes; these tubes it dilated; the cause being removed, the lacteals resumed their function of removing the toxic products which had accumulated in the blood, and did their work so well that in a few hours the all but fatal toxæmia was removed and the cow well.

I have now followed the problem in all its intricacies, and have made every point clear, all but one—the *nature* of the treatment and its *essence*.

Let me ask a question—two, in fact: *First,* what are you doing when you are dilating the ducts with your gas or air; of what are you thinking as you see the gland grow and grow to enormous dimensions and the skin becoming more and more tense; are you not thinking on the same lines as a person who is blowing up a football, or a boy who is blowing up soap bubbles? That is its nature. Are you not always thinking, can it stand more, and saying to yourself I think it can, I think it cannot, and whenever it is a failure it is the timid one who fails? That is its essence. That was always my thought long before I got the idea in my head that simple dilation constituted the cure. We all seem to know instinctively just what the cure consists of, and often when the air escaped in spite of my efforts to prevent it by the usual method of ligating the teats I dilated them again, and if necessary, again. The trouble seems to be that the treatment is entirely too simple; it certainly stands unique in that particular, and to accept it at only its face value seemingly threatens destruction to all preconceived ideas on the subject of therapeutics. Even more difficult of acceptance was the inference that the disease must prove even more innocent in its nature than its treatment. It meant revolution. I must admit it staggered me until I got used to it, but when a veterinarian cures milk fever, a disease that has successfully resisted every therapeutical agency since the dawn of medicine by injecting cow manure and other filth into a cow's

udder, the time for revolution is ripe. I believe it is here now.

As far as the discussion of milk fever is concerned, this paper might end, but the thought urges me on, the thought that Schmidt's discovery does not end with its explanation of the etiology of *one* disease—rather it is but a beginning. I myself believe it has opened up an *entirely new field of etiological research;* that we have by an accident stumbled upon a fertile but fallow plain filled with wonderful discoveries for the future investigator, a field based on the idea that a single gland in the body may be subject to the same disabilities as a particular part of a machine made by man; that it may get out of order in the self-same manner that accidents may happen to it, some slight, some serious, and some severe enough to put the whole machine suddenly and entirely out of commission.

There are many diseases that are still enshrouded in mystery that may possibly be explained on this theory. We are still very much at sea regarding the nature of such diseases as Graves', Addison's, Hodgkin's, Bright's, diabetes, rheumatism, gout, etc.; sudden deaths often occur in the midst of apparently good health, which cannot be explained by heart failure, apoplexy, ptomaine poisoning, acute Bright's, or acute indigestion; nor are those slighter ailments, designated as headache, nausea, nervous, bilious, "that tired feeling," the blues, etc., explained satisfactorily by a "disordered liver" or "stomach," constipation, etc. To-day epilepsy is considered to be a derangement of the nervous system; yesterday milk fever was so considered, with even more justification. It would be less surprising to find epilepsy having a simple origin than it was to find that milk fever had.

But the subject grows beyond me. I began this paper at Dr. Cochran's request meaning simply to pass tribute to a member of the profession whose discovery, I believe, constitutes an epoch in medicine, and to draw a parallel between milk fever and azoturia. As I said, the paper has grown and grown, and it was with difficulty I kept even within the bounds I have; I hope, however, that it has not made the paper less clear, nor befogged the new theory I am advancing of azoturia in the horse.

In studying this latter disease, I propose advancing along the lines pursued in the study of milk fever. Azoturia has many analogies to it: the attack is sudden; it occurs (usually) under supreme activity of certain organs (not the mammary, of course); is very fatal; recovery is often rapid and complete; there is no organic lesion as a primary cause, and its etiology is as much in the dark as ever.

As milk fever has always been connected with the period of lactation, when the mammary gland is in *supreme* activity, so azoturia has been connected with a period of *supreme* activity of digestion. The theories advanced are a hyper-nitrogenous condition of the blood, a defective liver, auto-infection, and in our extremity we have even requested the laboratory to discover a micro-organism.

I agree that azoturia is due to a hyper-nitrogenized condition of the blood, also that this hyper-nitrogenized condition of the blood is due to a defective liver. I propose to give my reasons for considering the liver the guilty gland, and to specify the defect.

The liver is the *first* to receive the blood from the intestines, it all passes through its tissues, it has the lion's share in blood metamorphosis. This is the one and only reason I hold the liver responsible. The special defect is with the bile ducts, and the nature of the defect—the same accident I have described as happening to the lacteal ducts, the same reasons given as producing closure of the lacteal ducts—hold good for closure of the bile ducts, excepting, of course, the emptying by milking. The ducts may possibly collapse normally in the intervals of digestion, and it may be that the absence of a gall bladder has some bearing on the matter. I would like to add, parenthetically, that I know of no reason why this accident could not happen to both ducts at other times than those of *supreme* activity.

To me there is a great analogy between the role played by the liver and that played by the mammary gland; the liver, as I have just stated, is the first to receive the blood for metamorphosis; the mammary gland receives it last. (In this respect it

is analogous to the kidneys.) The function of the liver may be said to be to feed the tissues, the function of the mammary to feed the calf. The liver, while producing blood metamorphosis, incidentally produces bile, and the mammary, while producing milk, incidentally produces blood metamorphosis, but though the processes are reversed yet are they the same, and an accident to the bile ducts would produce the same results in the liver as an accident to the lacteal ducts would produce in the mammary.

I wish now to refer back for a moment to the two theories of azoturia I am partly in accord with; I wish to call attention to an exaggeration, if not a misinterpretation, of a physiological fact, and to accentuate my point of departure.

It is universally admitted there is a lack of correlation between the different parts of the animal body (there must be); its exaggeration or misinterpretation is that this lack of correlation is extreme. These two theories are built on this error. Both theories may be summed up in a few words: the increased activity of intestinal absorption overcomes the system, is one; it overcomes the liver, is the other. That is, a perfectly normal system or a perfectly healthy liver (by way of a note here, I may add it is usually young and healthy horses that are affected) is overcome by a perfectly healthy set of cells in the intestinal villi. It sounds paradoxical. It is where I part company with these two theories. There is no proof of such lack of correlation in the system (but how many theories and what numberless diagnoses are advanced on the same misconception). Admitting there is great activity of intestinal absorption, how can we accept the inference that there is not an adequate increase in the system, or in the liver. These theories practically say that one set of cells (which cells, though part of the same system) can produce nutritive material so rapidly that it is impossible for the rest of the system or the liver to keep pace with it, in fact are so laggard that a condition of azoturia is induced in twenty-five minutes How prodigal of energy nature was in one case, and how niggardly in the other. When we consider that this difference of activity is the difference between parts performing the same func-

tion, and intended by nature to work in harmony, the misinterpretation of the physiological fact mentioned seems almost like asserting that in an automobile race the hind wheels of the same car may crash into the front ones. I think without further proof both theories would be disproved by the fact that some severe cases of azoturia recover quite rapidly, but we have further proof, the proof that Schmidt's treatment gives us in milk fever, where we found the cow all but dead from toxic blood, yet the mammary cells rose so nobly to the occasion that in a few hours the blood was normal.

Before closing I would like to say a word on the treatment of azoturia. According to my theory the only scientific treatment would be to dilate the bile ducts; this being impossible, it must be treated on general principles and along the lines pursued in uræmia. In fact, I recognize a great analogy between that disease and the two I have been discussing, and if I might be permitted I would coin new names for these two to show their relationship to it. Azoturia I would call *bilemia*, and milk fever I would call *lactemia*, and as uræmia demands all possible means of ridding the system of the accumulating and accumulated toxins, so I would advise in bilemia the stimulation of the kidneys, the bowels, the skin, and in addition, the use of those medicinal agents which may combine chemically with the toxins, or act as physiological antidotes.

As all treatment must in the nature of the case be empiric, each practitioner's experience is worthy of note. In my own I have found but three drugs which I thought influenced the disease favorably; they are *aloes, sweet spirits of nitre* and *aconite*. I have found hot blankets of benefit. In my own practice I have never bled a horse, but I had the privilege of seeing Dr. Cochran bleed about fifteen with a recovery of about seventy-five per cent. (I am speaking from memory). Expressing my opinion, I would say bleed extensively, if necessary replacing the lost blood with salt solution, and even repeating the operation. Bleeding acts in two ways: it removes the toxic blood from the system and lessens the pressure on the ducts from the engorged capillaries.

Always remember azoturia is a self-limited disease; when absorption from the villous structure ends, the disease begins to recede.

At the last meeting I ended this paper with several questions; acting on the knowledge received from that discussion, I have taken the liberty of leaving all of them out this time and formulating a new one. I thought it would confine the discussion to the point at issue better. This is the question: What *other* pathological condition than the one I have mentioned (a simple closing of the lacteal tubes) can exist in a cow's udder, that Schmidt's treatment will infallibly cure?

News Notes on the Fiftieth Anniversary of A. V. M. A.—In a recent communication from Secretary Marshall of the A. V. M. A., he enclosed the following copy of a letter received from the New England Passenger Association:

"Dear Sir—In connection with your application for reduced fares for the Fiftieth Anniversary Meeting of the American Veterinary Medical Association, am pleased to advise you that the lines in this association, excepting the Bangor and Aroostook R. R., Dominion Atlantic Railway & Steamship Lines and Eastern Steamship Corporation, have concurred in the tender of the Trunk Line Association and authorized reduced rate on fare and three-fifths, certificate plan basis, from the points named in the explanatory circular enclosed. Fee of twenty-five cents will be charged for each certificate vised. If any further detail is required in connection with fares from this territory will appreciate your advice. Very truly yours,

"M. L. Harris, Secretary."

The following lines constitute the New England Passenger Association: Bangor & Aroostook R. R., Boston & Albany R. R., Boston & Maine R. R., Canadian Pacific Ry., Central Vermont Ry., Dominion Atlantic Ry. and Steamship Lines, Eastern Steamship Corporation, Maine Central R. R., N. Y., N. H. & Hartford R. R., Quebec Central Ry., Rutland R. R. No other passenger association had been heard from to date, January 18.

The Right Man in the Right Place—Dr. Walter G. Hollingworth, at the request of Commissioner of Agriculture Huson, discussed the Stallion Registration Law problem at the New York Breeders' Association meeting, Utica, January 22.

HYDROPHOBIA (RABIES).*

By Dr. F. J. Cambon, New Orleans, La.

When asked by your J. Arthur Goodwin some few weeks ago for a paper, I consented to place my services at your disposal. While, however, I found willingness to oblige came readily enough, I discovered that the choice of a suitable subject came only tardily. Therefore, I decided to pen a few notes under the heading Hydrophobia.

"Hydrophobia" and "Rabies" are two different terms for the same disease; the former is derived from the Greek word, meaning dread of water. Consequently, as we find only in the human subject the dread of an attempt to drink water, the term "Hydrophobia" is properly used in such a case. A rabid dog will repeatedly attempt to drink water, even though the act induces a spasm of the deglutitory muscles. "Rabies," meaning rage or madness, applies more especially to the disease as we find it in the maniacal form in the lower animals.

The relation of water to the disease in the lower animals, chiefly dogs, is very much overrated. A dog never develops rabies from a lack of water—a common fallacy. A dog may be overheated during the hot summer weather; in addition it may not have sufficient water to quench its thirst, but these conditions alone cannot cause the disease. Invariably, whether the disease exists in man or animal, the history will point to a previous subjection by a diseased animal, for the transmission from animal to animal is necessary for the maintenance of the disease. Its occurrence is not limited to the hot weather, as was believed until recently; moreover, it should not be confused with a disease known as fits, common among dogs. This disease

* Presented to the Louisiana Veterinary Medical Association, at New Iberia, October, 1912.

differs from rabies in that it is of short duration, from thirty minutes to two hours. A rabid dog, on the contrary, is sick from three to seven days. A second part of differentiation between the two diseases is that rabid dogs seldom froth at the mouth; they may drool as a result of deglutitory paralysis, in which there is a drooping of the lower jaw, where, as in fits, there is profuse frothing accompanied by generalized clonic convulsions. Again, a rabid dog invariably dies as a result of this disease; on the other hand, one with fits often recovers. The latter disease should not be confused with rabies if the history is carefully investigated, and this confirmed by negative animal inoculations and absence of Negri bodies. The number of cases of rabies in Kansas City during the winter of 1909 and 1910 tends to disprove the "Dog Day" theory. The records of the Pasteur Institute for the winter showed an increase of about thirty-three per cent. in the number of cases over the summer months; these conditions, it should be added, were exceptional and largely due to the occurrence of an epidemic. Ordinarily we have only sporadic cases, yet veritable epidemics may occur as the result of negligence on the part of those whose duty it is to protect and preserve the public health.

All mammals are subject to the disease; it is, however, confined chiefly to dogs, owing to the fact that they naturally attack their own species. Although the canine by nature follows this rule, in the excitement stage it goes to the other extreme and bites even its own master, not to mention numerous horses, cattle, hogs, etc. The most vicious breeds are, of course, the most dangerous and do the most damage. About ninety per cent. of the cases are due to rabid dogs; the next most important factor in spreading the disease in this country is the cat, which is responsible for about four per cent. of the cases; the remaining six per cent. are due to horses, cattle, wolves, etc. In some countries, as in Russia, the wolf contributes a high percentage of cases.

Hydrophobia is an acute inoculation disease communicated to man by the saliva of an animal suffering from rabies. It is

due to a definite specific virus which is transmitted through the saliva either by the bite of a rabid animal or by the saliva coming in contact with a wound already existing. The normal habitat of the virus is the nervous system, and it retains its virulence only temporarily when introduced into any other system of organs. The fresh fixed virus injected into the blood stream does not usually cause the disease; morever, its injection by the intramuscular route does not give a high mortality, about fifty-nine per cent. If moderately thick homogeneous emulsions in collodion sacs are introduced into the peritoneal cavity, it is found that the virus is destroyed in six hours. The virus rapidly loses its virulence when not in its normal habitat; it is readily destroyed by heat and desiccation. In short, laboratory experiments prove that it cannot exist "in nature." When inoculated into a wound, this virus must come in immediate contact with a broken nerve trunk in order to survive and reproduce itself. If it gains entrance to the nerve trunk it is protected from the antagonistic action of the blood and lymph streams; it slowly extends to the cord and brain. Here a favorable media exists; the virus grows rapidly and the characteristic toxic symptoms are produced.

In considering the danger of infection from a wound inflicted by a rabid animal we find it advisable to classify the patients according to the following: (1), Location of the bite; (2), severity of the wound; (3), the degree of cauterization; (4), the lapse of time before reporting for treatment; (5), the stage of the disease in the animal at the time the wound was inflicted.

It may not be amiss to mention the great importance of the proper cauterization of the bite in dealing with the disease. The free use of fuming nitric acid is a satisfactory method of cauterization. The penetration of the acid makes it a valuable cauterization agent, but even when this procedure is carried out, about 10 per cent. of the experimental animals die. It is advisable, after sufficient application of the acid, to wash the wound freely with sterile physiologic salt solution, thus removing the acid and

preventing unnecessary destruction of the tissue. If nitric acid is not to be had, full strength phenol may be used.

It is, however, eminently important that this cauterization agent be washed from the wound by the free use of absolute alcohol. This procedure prevents subsequent ulceration which is so common when the alcohol is neglected.

The two agents, nitric acid and phenol, destroy the virus by virtue of their cauterizing action; yet in high dilution, neither has a disinfectant action on the virus. In fact, a one per cent. solution of carbolic acid is an excellent preservative for this particular virus; for instance, an emulsion of rabid brain made up in a one per cent. phenol solution, or any of its numerous derivations, will preserve the virulence for several weeks. In formaldehyd solution, on the other hand, we have a specific disinfectant for the virus. The specificity of the antiferment action of formaldehyd on rabies virus is easily demonstrated by laboratory experiments.

Formaldehyd in as high a dilution as 0.025 per cent. will destroy the virus in a short time. In the treatment of wounds inflicted by rabid dogs, the use of a 5 per cent. formaldehyd solution applied to the wound for twelve hours is preferable to the cauterizing action of nitric acid or phenol because of the specific disinfectant and penetrating action of the former.

Especially should this preliminary preventive measure be instituted in severe lacerated wounds, for in such wounds the degree of infection is high. The immediate treatment should not be neglected even after the lapse of a couple of days; moreover, under the latter condition, the wound should be opened and thoroughly scrubbed. If every wound, especially severe ones on the head, be thoroughly cauterized, and this immediately followed by anti-rabic treatment, the mortality would be nil among those bitten.

As to the time of exposure, it can reasonably be said that a wound on the hand after a delay of three weeks is quite as dangerous as a bite on the head exposed only a few days. The cumulative action and extension of the virus along the nerve

trunk to the central nervous system during the interval of exposure should always be borne in mind. Therefore, it is quite as necessary to prescribe an intensive form of treatment to a patient bitten slightly on the extremities with a prolonged exposure as it is to one with a recent head wound.

It is quite safe to say that the virus is not transmitted by the bite of a rabid animal until two days previous to the appearance of the first symptoms. The early symptoms, however, are often very obscure and so slight that they are not recognized. So it is with some difficulty that a decision is reached in advising patient bitten slightly on the extremities with a prolonged exment. If a dog which is naturally not a vicious kind suddenly bites without provocation, it should be tied securely and kept under close observation for at least seven days. Should the dog develop symptoms of rabies during its confinement the bite should be considered dangerous. An investigation of such a case will usually reveal the fact that the external cause inciting the dog to bite was not sufficient to cause the same act in the dog when normal. Occasionally the only recognized symptom in the early stages is a tendency to bite, but such cases, if kept under observation, develop well defined symptoms within a few days.

The first symptoms in rabies are those of mild or marked excitement, nervousness, irritability and often a tendency to stray away from home. This stage of the disease has a duration of about two days, seldom more than four days. As the disease progresses, the excitement becomes more marked, and unless this is cut short by generalized paralysis, the dog becomes furiously rabid. In this condition the dog is uncontrollable, it has hallucinations, and may, without provocation, bites its own master.

Partial paralysis marks the onset of the second stage of the disease. The paresis may be unilateral, or it may be limited to the hind extremities or the lower jaw. If there is paralysis of the posterior extremities the dog walks with a humped back and an apparent stiffening of those parts. Later they become weak and tremulous, and it is with difficulty that the dog walks. The droop-

ing of the lower jaw is a diagnostic sign, although it is not present in more than about thirty per cent. of the cases. The unilateral paralysis is characterized by a turning of the head to one side, and a tendency to cross the fore paws.

As this condition becomes more pronounced the animal is inclined to, and may run or walk in a circle. During the second stage the voice may change; it is at first low and muffled, finally it becomes difficult to evoke and is a succession of low pitched howls coming from far back in the throat. As the paralysis of the cheeks, mouth and lower jaw becomes more evident the power to bark is completely lost.

Although few rabid dogs eat and drink without discomfort, yet we find in the majority of cases repeated attempts will be made without success. In some cases, solid substances may be swallowed without discrimination, and on post mortem, when foreign material is found in the stomach there is sufficient evidence to arouse suspicion of rabies. Food may be held in the mouth for a short time and then dropped, a condition which may occur in advanced paralysis of the deglutitory muscles. As was stated in the opening paragraph, the rabid dog has no fear of water; a dread of water is, however, characteristic of hydrophobia in the human subject. The dog may not be able to swallow; despite this fact it will make many attempts, succeeding only in emptying a dish of water by splashing the water over the sides in the eager attempt to lap it up. The owner of this dog usually makes the statement that it could not be rabid because it drank one or more dishes of water.

When the paralytic stage appears early in the course of the disease the dog is usually morose but not aggressive; under such conditions we have the so-called dumb rabies. This type, however, is not as common as the maniacal form, in which there is a condition of furious rage, in the diagnosis of which there can be no mistake. This is the most common diagnostic feature of rabies in dogs. In this state of delirium the animal runs amuck, furiously attacking all animals, including man, and even its own master. It may travel as far as forty miles, leaving in its path

numerous bitten animals which in turn may act as spreaders of the disease.

The stage of paralysis lasts from one to four days, after which the third stage appears with complete loss of equilibrium. This period of paralysis varies from a few hours to two days. Finally, from two to seven days after the appearance of the first symptoms, death results from complete paralysis of the respiratory center.

The only method of treatment found so far, to be of any value in this disease is prevention.

The prevention of rabies infection resolves itself into two procedures. (1) The destruction of all ownerless and vagrant dogs, and the muzzling of all dogs that appear upon the streets or in public places; thus preventing the propagation of the virus. It is of interest to learn that rabies has been so completely eradicated from Great Britain by the enforcement of the muzzling regulations that the pathologists of that country were obliged to send to this country for material from which to make a study of the Negri Bodies when the discovery was made that the latter bore a most intimate relation to the transmission and development of rabies.

(2) The preventive inoculation known as the Pasteur Treatment, by which an immunity is produced by the subcutaneous injection of the virus of rabies in an attenuated form, beginning with the mildest virus and gradually going to up to one which possesses nearly or full virulence.

In the preparation of material for the preventive treatment, rabbits are inoculated with "fixed virus," a term given by Pasteur to virus, that is so exalted in virulence by successive inoculations (100 rabbits), that it will produce the death of these animals in six or seven days. Beyond this point no increase of virulence can be obtained, hence the name, "fixed virus." The spinal cord is removed aseptically from rabbits killed by the inoculation of fixed virus, cut into three pieces and suspended over a solution of caustic potash in a dark chamber. Here the cords are kept in the dark at a constant temperature of 23° C. for four-

teen days. Emulsions of the dried cord are prepared in sterile salt solution or broth and injected every day, or sometimes more frequently during a period of fifteen to twenty-one days. As a rule, the most attenuated material (14-day cord) is injected first, and this is followed by virus of gradually increasing strength. The method is essentially one of active immunization, and involves a race between the action of the attenuated virus and the virulent virus, introduced by the bite of the rabid animal. It follows therefore that the preventive treatment must always be begun at the earliest possible moment after the bite.

While the anti-rabic vaccine has been extensively used for the last twenty-four years for the prevention of rabies in the human, it is of comparatively recent date that it has been used in veterinary medicine. Its use by veterinarians has been made possible by its preparation in a form that can be sent to the practitioner at a point remote from the laboratory. Such a vaccine is of inestimable value in the control of rabies, and it is of considerable economic importance to the live stock industry.

During the month of March, 1911, Dr. Nisbet, of the American Biologic Company, of Kansas City, gave several animals bitten by a rabid dog the Pasteur Treatment. (The dog during the inoculation was found by microscopic and subdural inoculation to be rabid.) The treated animals did not contract rabies, while on the other hand, an untreated cow, bitten the same day by the same dog which bit the treated ones, died four weeks later of rabies.

Dr. Nisbet also supplied data on nineteen other cases as follows: Nine dogs, eight horses, one mule and one cow which were treated with anti-rabic vaccine supplied by H. M. Alexander & Co. Three of the 19 cases died of rabies; one dog died on the thirteenth day; one horse was destroyed after the treatment was completed because symptoms of rabies became evident, and the cow developed rabies one day after the treatment was completed. The dosage for the before mentioned ten cases was the same as given by Dr. Nisbet, but twenty-four doses were

given instead of twenty-one. Judging from the fact that the fatal cases developed rabies after treatment was completed, or near the end of the treatment, it seems advisable to use a more intensive treatment, that is, the doses given should be of a less attenuated cord.

Record of treatment administered to horse at Kansas City College of Comparative Medicine from March 6 to 23, 1911, inclusive. Each dose consisted of one centimeter of cord emulsified in five cubic centimeters of sterile salt solution.

Dose.	Proposed.	Age of Cord and Dosage.	Number of Cord.	Number of Injections Given Each Day.
No. 1	3- 6-11 A.M.	5 cc. of 8 days	2233 E	1st day 10 A.M.
No. 2	3- 6-11 A.M.	5 cc. of 7 days	2070 ‡	1st day 3 P.M.
No. 3	3- 6-11 A.M.	5 cc. of 6 days	2070 ‡	1st day 6 P.M.
No. 4	3- 7-11 A.M.	5 cc. of 5 days	2233 B	2d day 10 A.M.
No. 5	3- 7-11 A.M.	5 cc. of 4 days	2070 ‡	2d day 6 P.M.
No. 6	3- 8-11 A.M.	5 cc. of 3 days	2233 D	3d day 10 A.M.
No. 7	3- 9-11 A.M.	5 cc. of 2 days	2071 J	4th day 10 A.M.
No. 8	3-10-11 A.M.	4 cc. of 2 days	2070 ‡	5th day 10 A.M.
No. 9	3-10-11 A.M.	4 cc. of 2 days	2071 G	6th day 10 A.M.
No. 10	3-12-11 A.M.	4 cc. of 5 days	2072 D	7th day 10 A.M.
No. 11	3-13-11 A.M.	4 cc. of 3 days	2072 D	8th day 10 A.M.
No. 12	3-14-11 A.M.	4 cc. of 2 days	2072 D	9th day 10 A.M.
No. 13	3-15-11 A.M.	4 cc. of 5 days	2072 D	10th day 10 A.M.
No. 14	3-16-11 A.M.	4 cc. of 4 days	2072 D	11th day 10 A.M.
No. 15	3-17-11 A.M.	4 cc. of 3 days	2072 D	12th day 10 A.M.
No. 16	3-18-11 A.M.	4 cc. of 3 days	2072 D	13th day 10 A.M.
No. 17	3-19-11 A.M.	4 cc. of 2 days	2072 D	14th day 10 A.M.
No. 18	3-20-11 A.M.	4 cc. of 4 days	2072 E	15th day 10 A.M.
No. 19	3-21-11 A.M.	4 cc. of 3 days	2072 E	16th day 10 A.M.
No. 20	3-22-11 A.M.	4 cc. of 3 days	2072 E	17th day 10 A.M.
No. 21	3-23-11 A.M.	4 cc. of 2 days	2072 E	18th day 10 A.M.

Laymen will ask, "Where did the first case come from?" It is useless to discuss this question. Science is unable to solve the question of the origin or the end of things.

Rabies is never spontaneous. A dog may be exposed to conditions that are directly contrary to his habits of life, such as cold, heat, abuse, bad food, no food, too much food, yet he will never develop rabies unless infected with it. It is always the result of a bite or infection from a rabid animal. If we are to follow the teaching of scientific investigation, we are led to the conclusion that rabies is transmitted to man and to beast very largely through the bites of rabid dogs, and that the dog carries it from one locality to another. This being the case, the question of the control and eventually the eradication of rabies

resolves itself into the single and not over difficult problem of the elimination of the homeless, wandering dogs, and the careful watching and better care of the others. Whether this will be brought about by a general enactment of the chain and muzzle ordinance that has been so successfully enforced in other countries, or by a special dog tax, or by some other means, I am not prepared to say.

As a member of this association, I do earnestly recommend that we, either as a body or as individuals, take a firm stand on this question. We owe such action to our fellow men, also to the animals we are trying to save, and above all, to the faithful friend of man, the dog.

The period of incubation is quite variable, depending on the site of the wound, which is almost always a bite, the amount of virus introduced and its virulence. In general it may be said for all animals that the period of incubation seldom exceeds sixty days, the average period as given by Ravenal is as follows:

Man, 40 days; dog, 21 to 40 days; horse, 28 to 56 days; cats, 14 to 28 days; pigs, 14 to 21 days; goats, 14 to 21 days; birds, 14 to 40 days.

In rabbits inoculated subdurally with the brain from rabid animals, I found the period of incubation to vary from twelve to sixty-two days, and the duration of the disease to range from a few hours to three days.

AT A CONFERENCE ON GLANDERS, called in the Second Assistant Commissioner's office, in New York City in January, Commissioner Huson stated that 1,631 cases of glanders had been destroyed by his department during the fiscal year beginning October, 1911, and ending October, 1912; and out of that number 1,260 had been in New York City and Brooklyn. The object of the conference was to get an expression from the veterinarians and horse owners leading to an amendment of the agricultural law relative to the control of that disease. Detailed report in next issue.

DR. F. I. POGODA, Troop M, Fifth Cavalry, Schofield Barracks, Honolulu, H. I., has been transferred with his troop to Fort Huachuca, Arizona.

SOME OF THE MORE IMPORTANT INSECTS AFFECTING OUR FARM ANIMALS.*

By W. H. Dalrymple, M.R.C.V.S., Louisiana State University.

(*Concluded from January number.*)

The flies, however, seemed to pass from us, in plague-like numbers at least, and although present more or less all of the time, we do not now hear of any great damage being done by them.

Eggs are said to be laid not only in or on fresh wounds, but also in decaying vegetable matter, carcasses, etc., so that it would appear this fly is somewhat omnivorous in its taste, and this may account, in some measure, for its attacking fresh wounds when other classes of its food become scarce or difficult to obtain.

The usual line of treatment was to apply to or pack the wounds with some effective agent to destroy the larvæ or maggots, and, if possible, repel attacks of the fly.

Belonging to the family oestridæ are the bot-flies, some of the species being extremely destructive in various ways.

You are all, doubtless, quite familiar with this family of dipterous insects, and I will only touch upon some of the more important phases of their life history and the damage occasioned by them.

The mouth parts of this group are either rudimentary or entirely wanting, so that the flies can neither bite nor pierce the animal's skin.

According to Verrill, the eggs of the gastrophilus equi, the horse bot-fly, contain more or less perfectly developed larvæ when laid, and when they are mature, or have been a few days attached to the hair, they burst open and allow the young to escape almost instantaneously when moistened. Thus, when the

* Paper presented at the thirtieth anniversary of the Illinois State Veterinary Medical Association, Chicago December 6, 1912.

horse licks itself or its companions, the warm moist tongue hatches the eggs, and the young larvæ are transferred to the stomach, where they fasten themselves to the lining membrane by two hooks.

It has been said that the grub or bot spends about eight months in the alimentary tract, six weeks in the pupal stage outside of the body, and after the fly emerges from its pupal case it occupies the remaining ten weeks of the twelve months proceeding with the business of providing for another generation of bots.

But in addition to the gastrophilus equi there are other bot flies affecting the horse; viz., the gastrophilus hæmorrhoidalis or red-tailed bot-fly, and the gastrophilus nasalis or "chin-fly." Their habits are similar to the equi. There are certain distinguishing characteristics, however, as to color and size and the tendency to attack the neighborhood of the lips and nose within easy reach of the tongue.

As a matter of prevention, the indications would necessarily point to preventing the fly from laying her eggs by suitable repellents; the use of a solution, such as carbolic acid, some of the coal tar dips, kerosene, etc., to destroy the eggs attached to the hair, or shaving the eggs off with a sharp knife or razor.

In case of stabled animals, ordinary good grooming will generally serve to remove any eggs present, but with horses, colts, etc., at pasture the case is different, as the animals may, in some cases, not be seen for considerable periods. However, it may be possible, during the late summer and early fall, to have this class of stock examined at short intervals, of a week or two, and the eggs removed or destroyed, which may be accomplished in the manner and with the materials just suggested.

It is difficult to recommend any single, definite line of action that may be considered *par excellence*. However, a working knowledge of the life history and habits of the insects may often suggest methods that will prove more or less effective in many cases.

As to remedial measures, well, all sorts have been recom-

mended. Those which happen to be administered at or about the time the bots are leaving the digestive tract in considerable numbers, and of their own accord generally get the credit of being "specifics."

So far as my information goes, the bi-sulphide of carbon seems to have given the most satisfactory results in the removal of the oestrus larvæ. It was Perroncito, I think, who was the first to report on the use of this agent in this connection. It is recommended to be given to adult horses in gelatin capsules containing 10 grams each, and 8 grams for colts. One capsule is given an one-hour intervals until three have been administered, and the last capsule followed 12 hours later by a purgative.

Passing to the bot-fly of cattle, sometimes called warble or wolf-fly, the interesting announcement was made by Dr. Cooper Curtice some years ago, and which seems to have been verified since, that the larvæ reached the backs of the animals through the mouth, and by way of the oesophagus, which was quite a discovery, and indicated that our common form was not the oestrus bovis of Europe, but oestrus lineata, or heel-fly, likewise, however, European in distribution. The larva is said to occupy several months in getting to the skin, while the development after reaching this location is more rapid.

The losses from warble-flies may be considered from three points:

1. Loss on hides perforated by the grubs, subjecting them to discount or rejection in the markets.

2. Loss in milk and beef supply, caused by fretting and stampeding, due to the presence of the flies when depositing their eggs.

3. Loss of vitality and weakened condition, and consequent loss in milk or beef, due to the presence of the warbles in the back, and possibly the sores occasioned by them.

It is difficult to obtain an accurate estimate of the sum total of these losses, but as the result of many inquiries and testimony

from numerous sources, the late Miss Eleanor Ormerod, the British entomologist, estimated the loss in England at $5 per head for cattle. What the aggregate amount in this country would be, it is hard to say, but it would certainly run away up into the millions of dollars. Prof. Herbert Osborn states that omitting the creature's comfort as a matter of mere sentiment, and considering the question from the practical standpoint of money returned, it requires only the very modest estimate of the loss of $1 per head to the cattle of the United States to show a loss of about $36,000,000 sustained by the country on the basis of the census of 1880. But in 1910 there were something over 69,000,000 milk cows and other cattle in the United States which, at $1 per head, would make the loss from the ravages of the warble-fly total up the enormous sum of, approximately, $69,000,000.

The remedial measures recommended are several; viz., those to present the deposition of eggs, those to destroy the eggs and young grubs, and those to kill the larvæ after passing under the hide. I am firmly of the opinion, however, that if the standard arsenical solution was systematically used all over the country as it is with us in the South for the destruction of cattle ticks it need not be many years before the country was practically free of these expensive parasites. It is our experience that in sections where dipping in this solution has been practiced regularly and systematically for a season or two, cattle are practically free of these grubs, wolves, or warbles, in their backs.

The last of this group which I will mention, briefly, is the sheep bot-fly—oestrus ovis.

The older authorities claimed that this fly laid its *eggs* in the nostrils of sheep. Later observers state, however, that the living larvæ, or maggots, are deposited, and that this point may now be considered as well established, except, perhaps, when the flies are fortunate in finding their victim without delay, eggs may be deposited, but in such cases they doubtless hatch immediately after deposition.

The larva at once begins to work its way up the nostrils and

nasal passages, and frequently reaches the sinuses. It attaches to the membrane by two small hooks and feeds upon the mucus. When ready to assume the pupa form, those grubs that are able to do so pass down to the ground where they quickly bury themselves. They remain in this dormant stage for about 40 or 50 days, or more, according to weather conditions, when each fly pushes open a little round cap-piece at the head-end, and thus arrives at maturity.

The grubs found in the head may range from two or three to quite a considerable number. I have, myself, taken forty-two of these larvæ from the head of a sheep that had died from parasitism of a different nature, however.

The prevention of the deposition of the young larvæ is generally the point aimed at, and various means are resorted to to accomplish this end. One that is quite common is to bore two-inch auger holes in a log, fill the holes with salt, and smear tar around the upper edge so that the sheep, in obtaining the salt, tar their own noses, which acts as a repellent to the flies.

Valuable animals may be trephined to remove the grubs from the sinuses.

I am rather inclined to the opinion that the country butcher-pen is a great harborer and breeder of these flies, and that if sheep's heads, which are often thrown away as offal in such places, were carefully destroyed, to destroy the larvæ that may pass from them to the ground to pupate, it might materially reduce the number of these flies in each locality.

Another source of great annoyance to certain classes of live stock, and which it is believed is also responsible for the transmission of some of the important infections, is the family tabanidæ, to which the horse-flies belong.

The members of this family are large, some of them being among the largest of the order diptera, and the females are provided with powerful mouth-parts, by means of which they inflict painful bites upon horses, cattle and other animals. Their flight is very strong and rapid, and is attended with a buzzing, tormenting noise.

Such of the larvæ as are known are either aquatic or live in moist earth, and are carnivorous. But notwithstanding the abundance of the insects, comparatively little has been done toward determining the early stages of the species.

Being carnivorous, and predatory upon snails, injurious insects, etc., the larvæ of the tabanids have sometimes been classed as beneficial, which may compensate, in some degree, for the bloodthirsty habits of the adult females. They are, unfortunately, so far as the animal is concerned, not open to successful attack in the larval stage.

Tabanids are widely distributed—species occurring in all parts of the world. Up to about 1896 it was said that 1,300 or more species were known, of which 150 were credited to North America. Since that time, however, the number has been considerably added to, over 300 having been catalogued so far.

The circumstantial evidence with us in the South is strong enough to force the conviction that these flies are wide distributors of anthrax infection, as it seems to be in seasons of their greater prevalence that this disease is most abundant.

Powerful repellents are recommended, or nets, in the case of animals that are being used. A thin film of kerosene over pools of stagnant water, frequented by the flies, will destroy large numbers of them, which was recommended some years ago by Porchinski, a Russian entomologist. But the greatest relief will come through clearing, draining, and the cultivation of the land areas which at present form the breeding places of these animal pests.

Just a word about buffalo gnats, family simuliidæ.

There are several species of buffalo gnats, and the injuries caused by them are among the most serious resulting from insect attack on domestic animals. They are small black flies, with a humped thorax and the head bent under, somewhat resembling the buffalo, and from which, I presume, they received their name. The early stages are aquatic, and the larvæ of the southern buffalo gnat (simulium pecuarum) is carnivorous, and probably others have a similar habit.

These gnats evidently emit a poison when biting, and a number of remedies have been tried to counteract it, but without any uniformity of effect. Aqua ammonia externally, and, internally, ammonium carbonate and whisky, have been used with fair results, at the same time keeping the animal in a cool, darkened stable, and also immersion in the cold water of running streams. Burning smudges attached to the hames is a method frequently adopted when the work stock are in the field.

While it has not been absolutely shown that these gnats are responsible for the transmission of disease—except their presumed connection with the transmission of pellagra—their habits of feeding upon so many different varieties of animals, as well as man, make it possible for them to act as carriers of infection.

Being aquatic, or semi-aquatic, in the early stages of their development, it would seem that attention should be given to their breeding places, and the attack directed toward their destruction in the immature forms.

My paper is already considerably longer than I had hoped to make it, but I think it would ill-become me—from the tick-infected section of the country—to close without making brief allusion to the "margaropus annulatus," the common cattle tick, or fever tick, which has been and is costing the country so much.

The cattle tick is not a dipterous insect; in fact, is not a true insect, like those we have just been discussing. That is, it does not have any wings, "but it gets there just the same." It belongs to the order acarina, and the family ixodidæ, and is the most important tick attacking cattle in North America.

As there is a large amount of available literature concerning this pest, it seems unnecessary to go into detail regarding it. Suffice it to say that the eradication of this tick from the southern states is, perhaps, the greatest agricultural and industrial problem before the people of that section of the country to-day. That is can be accomplished is evidenced by the large amount of territory already cleared of ticks and in the free area through the co-operative effort of federal and state authorities, aided

by the dipping vat and the standard arsenical solution. Or, as some of our poetic veterinary inspectors have rhymed it:

"The dipping vat's the famous trick
To eradicate the cattle tick."

It is a practical proposition and only needs money to make it an absolute success. And the more money appropriated by Congress and the different states affected for this work the sooner will we have a tick-free country, with the most profitable markets free and open to the product of every section of it, without let or hindrance.

This will not only benefit the southern section in having an open market, but it will open up a vast rich cattle-raising country which will have to depend, for some time to come, upon the northern breeder of pure-bred animals to supply the demand for improved breeding stock, and it will also open up a rich field for a largely increased number of members of the veterinary profession.

The last Congress appropriated $250,000 to cover the federal government's assistance in this work, and it is the desire of those interested in this great uplift for the South to make an appeal, through every available and appropriate channel, to the present Congress to increase the amount to $400,000 for the coming season.

I do not know of any investment that Congress could make that would give to the country such valuable returns, and if not out of place here, I would like to suggest that the Illinois State Veterinary Medical Association pass a resolution recommending that Congress appropriate at the present session $400,000 to further facilitate the work of tick eradication in the infected area of the country.

KENTUCKY VETERINARIANS HOLD SUCCESSFUL MEETING AT LEXINGTON—Too late for publication in this number, we received from Secretary Robinson, of the Kentucky Veterinary Medical Association, a report of a very successful meeting at the State University, which we will publish in our next issue.

MATERIA MEDICA—PROBLEMS AND PROGRESS.*

By George Judisch, Professor of Pharmacy, Iowa State College, Ames, Ia.

The days of faith and mystery are, very happily, passing into medical history. Competent and careful practitioners no longer accept authority without the facts. Chemical analysis and pharmacologic investigation have confirmed or condemned the reputation of many an agent employed in the healing art.

The therapeutic nihilist is rapidly passing away because investigation and experimentation, laboratory and clinical, have proven the potency and value of many drugs.

Some years ago the medical profession insisted that prescriptions or proprietary compounds should be pleasing to eye and palate. This desire for pharmaceutical elegance, associated with the ancient idea that a "mixture" exercised some subtle influence, caused the market to become flooded with many more or less useless products. That influence has left its mark on our present pharmacopoeia. Practitioners employing their highly exploited and wonderfully compounded products were disappointed with results and "therapeutic nihilism" was the natural outcome.

Pharmacology is lighting the way to rational medicine. It enables us to separate the grain from the chaff. Being able to select the useful and reject the less useful or useless it seems high time that the veterinary profession adopt the system proposed by a committee of the American Medical Association. This committee suggests, and the suggestion will doubtless be adopted, that only the most useful drugs be included in the materia medica or pharmaco-dynamics course. In this way the student would acquire a thorough knowledge of his remedial agents, whilst at

* Presented to the twenty-fifth annual meeting of the Iowa Veterinary Association, at Ames, November 12, 1912.

present, being obliged to give consideration to a large number in order that he may pass state and other examinations, he has little more than a conversational knowledge of them. We all know that the average doctor limits himself to 20 or 25 drugs, in fact, very few employ that number. Why befog the student's mind with a long list of diuretics, diaphoretics, etc., when two or three will meet all indications? Why teach slightly efficient when we have highly efficient products? Whilst thinking of efficiency and potentiality let us devote a few moments' consideration to "new products," "less toxic," "more efficient" products than the old standards. A bee without a stinger is a drone. A toxic drug, or one producing unpleasant symptoms, when presented in a new form that will not produce those symptoms has been partially or completely robbed of its efficiency.

Iodides are iodides, salicylates are salicylates and if administered in an assimilable form will produce their characteristic effects. If they do not produce these symptoms they are lacking in iodine or salicylic acid contents.

Ethpharmacal products having value and lauded by enterprising manufacturers will, upon close investigation, prove to owe their virtue to an old and time tried drug. You will observe that the formula, if printed on the package, mentions drugs with which you are unfamiliar. In order to add to the mystery and the more thoroughly befog the doctor, the full botanical names are usually expressed. If the product, by way of illustration, happens to be a blister you will, upon strict search, find that the really active and valuable ingredient is your old friend red mercuric iodide.

Why pay an extravagant price for a product that you can prescribe or dispense at a nominal figure? It is the doctor's duty to restore his patient to health as quickly, as safely and as cheaply as the nature of the case will admit.

The following is a partial quotation from a letter published in the last number of *The Journal of the American Medical Association*. "It seems as if there were a large percentage of the profession waiting for some salesman to come along and hand him

green or pink pills, telling him that they are good for almost everything, from nephritis to the vomiting of pregnancy, and explaining how much more cheaply than the other fellow he can sell to you————. It seems as if the average physician could not say 'no' to these semi-patent medicine agents, and this accounts for the number of thrifty proprietary houses which are supported by the 'gullible doctor.' If the average man will just 'mix a few brains' with his prescription work and not depend on the inert proprietary drug, but insist on his prescription being filled with drugs from a reputable house, I feel sure that more of us would have much faith and better results in our drug therapy."

No new drug has, within the last year, illuminated the medical sky with its achievements, yet there is progress to report. There is as much advancement in ascertaining that a drug is inert as there is in adding a new one to our already long list of remedies. Within the last year Dr. Hatcher, if my memory serves me rightly, an eminent pharmacologist, reported his pharmacologic investigations of cactus grandiflorus. In order that his research might be as free as possible from errors, he requested a botanist of high standing to collect a quantity of the plant. It was carefully preserved, extracted by competent men and the alcoholic extract administered, hypodermically, to cats, dogs and guinea-pigs. He also, at the same time, injected into a control animal a hydroalcoholic liquid containing the same percentage of alcohol as the extract of cactus grandiflorus. The kymographic readings were identical. He then prepared an extract, in vacuo, so as to eliminate the alcoholic influence. If my memory serves me rightly the quantity of solid extract injected into a cat was 6 drams. Proportionate quantities were used in the same way on other animals with uniform results; absolutely no influence on the heart. This product was introduced into medicine about thirty years ago and it was claimed by some that it possessed all the heart tonic properties of digitalis without any of its disadvantages. Dr. Hatcher's careful and thorough pharmacologic investigation has proven it worthless and, as Dr.

Hatcher in his article stated, is interesting only in the fact that it is absolutely worthless.

A product quite generally employed in human medicine with favorable results that might prove of value in veterinary medicine is hexamethylenamine, also known as hexamethyltetramine, urotropin, formin, aminoform, cystogen. This product is found on the market as a white crystalline powder and is obtained by the action of formaldehyde upon ammonia .6CH2 N4. It is freely soluble in water and the slightly bitterish sweet taste is imperceptible if properly administered, dissolved in 8 to 16 ounces of water. Prof. A. Nicolaier, of Berlin, introduced this product into therapeutics and recommended it as a urinary antiseptic, and it heads the list in that class of remedies. Formin, at body temperature, is gradually decomposed in the stagnant fluids of the body, formaldehyde being liberated. The decomposition is more rapid if the fluid, as urine, is acid in reaction, but it exercises a decided bactericidal influence if decomposition does not occur. It is alkaline in reaction, but in some way, not as yet understood, causes an alkaline urine to become acid. Cases have been reported of its administration before operation on the brain with decided benefit due to its antiseptic influence on the cerebrospinal fluids.

Dr. Zak was impressed with the scanty bacteriologic findings in the rusty sputum of a pneumonic patient who had been given hexamethylenamine in the treatment for another affection. The same writer found that the drug is eliminated in the saliva and bronchial secretions.

Dr. Crowe states that the following conditions may be favorably influenced by the administration of formin. Infections of the genito-urinary tract and typhoid bacilluria. Infections of the bile ducts and gall bladder. Infections of the cerebrospinal system as epidemic meningitis, meningeal infections following injuries or infectious processes elsewhere in the body. Infections of the respiratory tract, including infections of the paranasal sinuses and ears, acute rhinitis and some forms of bronchitis.

Casper injected formin under the skin of a rabbit and found

formaldehyde in the blood. This is the only experiment on animals that I have been able to find, but the drug certainly is worthy of a thorough trial by veterinarians.

Sulphocarbolates.—At the last meeting of the society the sulphocarbolates were highly recommended as intestinal antiseptics by several members. At the time of the discussion it seemed to me that these products were credited with a value they do not possess and I decided to inquire into the subject. The three sulphocarbolates usually employed are those of potassium, sodium and zinc, the latter two being official in the U. S. P. They were, at one time, employed in a limited way as intestinal antiseptics in human medicine, but were soon abandoned as ineffective. I quote the following from Dr. Torald Sollman, Professor of Pharmacology and Materia Medica in the Medical Department of Western Reserve University: "The great toxicity of phenol, its very pronounced local irritant action, and its rapid absorption, all lessen very greatly its therapeutic value, and active search has been made for compounds devoid of these undesired properties. The following methods have been tried. By substituting an acid radicle for an H in the C^6H^5 of the phenol relatively non-toxic compounds are produced. Such are the phenolsulphonates. This combination is, however, useless, since it detroys the antiseptic power as well." Dr. Arthur R. Cushny, Professor of Pharmacology in the University of London, has the following to say regarding sulphocarbolates: "The sulphon group lessens the toxicity in the same way as carboxyl and the sulphocarbolates or para phenol sulphonates are therefore less poisonous than carbolic acid. The sulphocarbolates of sodium and zinc have been used as external antiseptics, and the sulphocarbolate of sodium has been administered to arrest fermentation in the stomach. The zinc salt possesses some astringent action and has been used with good results as an injection in gonorrhœa. The sodium salt is probably excreted in the urine unchanged." Dr. H. C. Wood, Jr., Associate Professor of Pharmacology, University of Pennsylvania, in Wood's Therapeutics: "Both the sodium and zinc salts sulphocarbolates are official in

the U. S. P. The sulphocarbolates were introduced some years ago as intestinal antiseptics, for which purpose it was evidently expected they would possess the antiseptic virtues of carbolic acid and the innocuousness of the sulphocarbolates. It has been shown, however, by Withers that they are not possessed of any direct antiseptic power. More recently it has been claimed for them that they are decomposed in the intestinal tract with the liberation of carbolic acid, but we know of no experimental or scientific evidence tending to show the truth of this belief, and their value is extremely doubtful." You will observe that authorities are agreed that the sulphocarbolates are not decomposed in the intestinal tract, the chemical bond between the sulphonic acid and base being a strong one. It is my understanding that the usual dose for a hog is 30 grains or ½ dram. For purpose of argument we will say that the product is decomposed and grant for the time that absorption does not take place. The decomposition would result in soda sulphate and phenol. Thirty grains composed of equal parts of the sulphocarbolates of potassium, sodium zinc would, upon decomposition, liberate 11 52/100 grains of phenol. According to Fred Smith's *Veterinary Physiology* the average bowel capacity of the pig is 5 9/10 gallons. This would if absorption did not occur and the phenol were uniformly distributed throughout the intestinal tract result in .015 of a grain to each fluid ounce.

Bacteriologists tell us that a solution of 1/400 of phenol exercises some influence on bacteria, but weaker solutions do not. A solution of .015 of a grain of phenol to one fluid ounce will result in a solution of approximately 1 in 30333.

Sulphocarbolates were highly recommended for hog cholera at last year's meeting. You will observe from the foregoing that if decomposition did occur the resulting antiseptic action would be a negligible quantity. We must remember, however, that hog cholera virus is unusually resistant to antiseptics. Uhlenhutt reports the following results from numerous experiments with hog cholera virus: 5/10 per cent. solution of phenol did not destroy the virulence of the virus after twelve days. A 1 per

cent. solution did not affect the virulence in four days and a 2 5/10 solution did not affect the virus in three days. In another experiment it did not affect it in thirteen days. He then employed a 3.3 per cent. solution with negative results. In view of these facts the original conclusion that sulphocarbolates are worthless as intestinal antiseptics must stand.

EARNESTNESS OF PURPOSE AND PROFESSIONAL EFFICIENCY RECOGNIZED BY GOVERNOR OF MAINE.—Dr. Achilles Joly, of Waterville, Maine, has recently been appointed Live Stock Sanitary Commissioner of that Commonwealth by Governor William T. Haines, and it is needless to add that the appointment meets with the hearty approval of the Maine veterinarians, as Dr. Joly is highly esteemed by his colleagues, who on three different occasions have elected him president of their state organization, of which he was one of the founders in 1893, and has held about all the offices in it at one time or another. The doctor is also an old member of the A. V. M. A., and represents his state in that organization as resident state secretary. He has always been an active worker along the lines of sanitary medicine, is a member of the Central Maine Anti-Tuberculosis Society, of Sidney Grange, and Patrons of Husbandry. His ambition for the uplift of his profession in his state found vent in the active part taken by him with his fellows in organizing the State Board of Veterinary Examiners, and in his services as secretary of that board during the past eight years since its organization. The REVIEW congratulates Dr. Joly on the recognition of his worth shown him by his state after twenty-three years as a veterinary practitioner there, and congratulates still more the veterinary profession and live stock owners of the state of Maine in having Dr. Joly to direct so important a branch of agriculture.

DR. A. JOLY,
Live Stock Sanitary Commissioner. Augusta, Me.

DR. JOHN MCCARTNEY, for some years assistant to Dr. E. B. Ackerman, Brooklyn, has located in Middletown, N. Y.

FIXED HOG CHOLERA VIRUS.*†

By John Reichel, Glenolden, Pa.

Hog cholera is at present correctly classed as one of the invisible-virus diseases. Little has been added to the work of Dorset, Bolton and McBryrde (1) in which they proved the specificity of the virus. Aside from knowing that it is invisible, filterable, demonstrable only by injecting suspected material into susceptible hogs, easily destroyed by heat and unusually resistant to some of the well-known disinfectants we have no clue to its real nature. The work of Dinwiddie (2) presented at the forty-ninth annual meeting of the American Veterinary Medical Association encourages the hope that the tissue-element, the red blood corpuscles, of the hog may perhaps be demonstrated as the host of the specific cause.

Judging from the natural outbreaks of the disease the variation in the virulence of virus is a very important characteristic, upon which preventive measures including the success in the immunizing and curative treatment with hog cholera serum largely depends. In preparing virus or virulent blood for 1,181 hyperimmune hogs, 1,964 supposedly susceptible hogs were injected subcutaneously with from 2 to 5 c.c. doses of virus, and only 144 or 7.3 per cent. resisted infection. The 1,720 or 93.7 per cent. all developed the disease in less than 40 days.

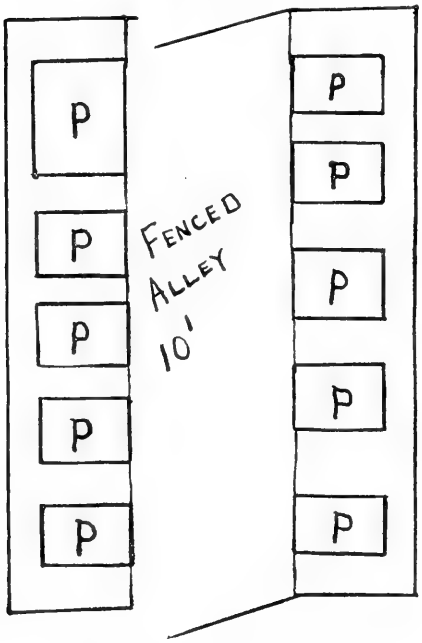
The virus hogs were kept in regulation virus pens, 8 by 10 feet, elevated 18 inches from the ground on four legs, waterproof

* Read at the meeting of the United States Live Stock Sanitary Association, December 4, 1912.

† Published in the *Journal of Infectious Diseases*, January, 1913.

(1) Dorset, Bolten and McBryrde, B. A. I. U. S. Dept. of Agric. Bulletin No. 72.

(2) Dinwiddie, Report of the 49th Annual Meeting of the American Veterinary Medical Association.



OUTLINE OF VIRUS-PEN ENCLOSURE.

metal lined floor, slant roof, both sides solid, small narrow drop door for ventila- in back, with door and two window in front. Each pen is equipped with a wooden feeding trough and card holder to accommodate a card for each hog. The pens are placed in two rows of five each, from 4 to 5 feet apart. The two rows are separated by a fenced alley approximately 10 feet wide. The group of pens in turn is surrounded by a fence which prevents all communication from pen to pen except by the doorway of each pen.

Although 19 strains are listed in Table No. 1 not all of the strains were continually passed through susceptible hogs. No more than six were passed through hogs in the virus pens at any one time. The table records 13 separate, but not consecutive months. In fact a number of the strains listed were acquired several years ago, and when not passed through hogs during any one month the "seed" of the strain was kept in sealed bulbs at a low temperature, the month was not counted in the tabulation. A strain passed through hogs during a number of separate but not consecutive months was injected into not less than one lot of hogs each month and during that month the strain may have been passed through two or more hogs. Although the hogs were injected for the chief object of producing virus or virulent blood for the injection of hyperimmune hogs every effort was made to increase the virulence of the strains and to keep them pure, so that the stronger would not supplant the weaker. All the hogs for the production of virus were purchased by one who was thor-

TABLE NO. 1.

Passage of Hog Cholera Virus Through Susceptible Hogs.

Virus.	Source.	First Month.	Second Month.	Third Month.	Fourth Month.	Fifth Month.	Sixth Month.	Seventh Month.	Eighth Month.	Ninth Month.	Tenth Month.	Eleventh Month.	Twelfth Month.	Thirteenth Month.
V1.	North Dakota..	*46	29	54	49	37	11	14	9	6	..	..	..	..
		†9.5	10.9	7.7	7.5	11.5	17.8	7.6	9.7	11.3	..	..	..	..
V2.	Minnesota	21	5	49	36	30	12	10	17	16	..	..	..	..
		7.2	8.8	9.3	5.4	7.1	7.7	7.1	10.6	6.7	..	..	..	..
V3.	Pennsylvania ..	43	6	3	16	29	10	4	8	3	..	..	..	..
		19.4	4	10.3	7.2	6.5	6.4	7.2	9.3	10.3	..	..	..	..
V4.	Pennsylvania ..	6	6	7	9	8	8	5	3	6	..	..	..	..
		14.4	8.6	6.4	5.9	5.5	9.2	8	6.6	5.6	..	..	..	..
V5.	North Dakota..	8	83	6	1	12	5	5	6	..	..	..	..	..
		12.1	12.2	19.5	15	9.9	6.6	11.2	7.5	..	..	..	..	..
V6.	Ohio	6	2	18	7	2	5	5	..	..	..	..	..	..
		17.6	8.5	9.2	10.2	6.5	6.6	5.2	..	..	..	..	..	..
V7.	Pennsylvania ..	4	..	..	..	..	..	..	..	..	..	..	..	..
		7.7	..	..	..	..	..	..	..	..	..	..	..	..
V8.	Minnesota	1	9	..	..	..	..	..	..	..	..	..	..	..
		8	7.8	..	..	..	..	..	..	..	..	..	..	..
V9.	Minnesota	51	15	..	..	..	..	..	..	..	..	..	..	..
		8	6.3	..	..	..	..	..	..	..	..	..	..	..
V10.	Minnesota ...	7	..	..	..	..	..	..	..	..	..	..	..	..
		6.8	..	..	..	..	..	..	..	..	..	..	..	..
V11.	Delaware ...	29	28	18	31	16	..	..	..	..	..	..	..	..
		40.1	27.1	10.3	11.2	9.4	..	..	..	..	..	..	..	..
V12.	Ohio	5	4	..	..	..	..	..	..	..	..	..	..	..
		14.2	15	..	..	..	..	..	..	..	..	..	..	..
V13.	.....	25	64	11	16	25	4	59	1	18	179	121	120	37
		30.1	21.2	20.5	30	36.2	12	13.4	5	19.2	11.4	20.4	14.1	21.3
V14	Pennsylvania .	3	..	..	..	..	..	..	..	..	..	..	..	..
		22.3	..	..	..	..	..	..	..	..	..	..	..	..
V15.	Kansas	11	58	11	..	..	..	..	..	..	..	..	..	..
		8.5	9.2	7.8	..	..	..	..	..	..	..	..	..	..
V16.	New Jersey ..	15	..	..	..	..	..	..	..	..	..	..	..	..
		14.2	..	..	..	..	..	..	..	..	..	..	..	..
V17.	New Jersey ..	20	..	..	..	..	..	..	..	..	..	..	..	..
		10.2	..	..	..	..	..	..	..	..	..	..	..	..
V18.	Missouri	2	..	..	..	..	..	..	..	..	..	..	..	..
		6.5	..	..	..	..	..	..	..	..	..	..	..	..
V19.	Missouri	6	..	..	..	..	..	..	..	..	..	..	..	..
		9.6	..	..	..	..	..	..	..	..	..	..	..	..

* Number of susceptible hogs injected.

† Average number of days in which hog cholera was developed before killed for virus or died.

oughly familiar with our needs. That they should be corn-fed and from hog-cholera-free sections of the country where chief requisites, that susceptible hogs were supplied is known by the fact 93.7 per cent. succumb. If, as happened several times, there was reason to believe that the hogs were infected upon arrival, no "seed" was saved to carry the strain from the suspected lot.

Upon the arrival of a lot of hogs for the virus-pens, each hog was injected with from 2 to 5 c.c. of the seed-virus, and placed in the virus-pen assigned to the strain. The pens were not cleaned during the time each lot of hogs were kept in them. Grain was fed twice daily and water placed in the feed troughs without entering the pens. Temperatures, however, were taken daily and recorded. This was usually entrusted to one man who went from one pen to the next. Therein lies the possibility that infection was carried from one pen to the other, but a careful study of the tables show that any increase in virulence was gradual. Moreover the care exercised in selecting the strain for "seed" reduced to a minimum the possibility that a weak strain was supplanted by a stronger.

According to this the 19 strains had their origin in natural outbreaks in 8 States. The top figure in each square opposite the number of each strain includes the number of hogs injected during each month; the lower figure gives the average number of days from the time the hog was injected until the disease had sufficiently developed for us to kill the hog for virus or virulent blood. Sudden deaths, before the hog was bled, are included as hogs killed.

With the exception of virus No. 1, the strains show a gradual increase in virulence, and we believe that we have had some of the strains under observation sufficiently long for us to regard them as having attained the maximum virulence possible—in other words, that these strains have or are rapidly approaching what Pasteur, working with rabies virus, called a "fixed virus." These strains are capable of producing the first symptoms, loss of appetite, occasionally reddening of the skin, and temperature-rise on the fifth or sixth day, with death on the seventh or eighth

day as a direct result of the injection subcutaneously in 2 to 5 c.c. doses. The hogs killed in less than 5 days, included in the table, were probably of the small class infected before arrival.

It is interesting to note at this time that fixed rabies virus will bring about symptoms of the disease in rabbits following subdural injection on the sixth or seventh day, and death on the eighth or ninth day. The period of incubation of fixed strains of the so-called invisible viruses may be quite similar in length.

The virus or virulent blood collected from 1,720 hogs was entirely used up in hyperimmunizing 1,181 hogs, of which only 6.7 per cent. received one or more intraperitoneal injections, and 2.7 per cent. one or more subcutaneous. All the injections were made intravenously except in the percentage referred to, when intraperitoneal or subcutaneous injections were alone possible.

Virus propagated in the manner outlined above and injected intravenously will yield a uniformly potent serum, as has been proved by the accepted standard test of injecting 6 susceptible pigs each weighing not less than 50 pounds with 2 c.c. doses of virus, fixed virus being invariably used; 2 are then injected with 15 c.c. and 2 with 20 c.c. doses of the serum under test, and 2 are left untreated with serum, to serve as controls or checks on the virulence of the virus used and the susceptibility of the pigs. The virus used should kill the controls in at least 21 days, while the serum should save pigs treated.

DR. RUTHERFORD ON THE JUDGES' STAND.—In scanning the pages of the January number of *Bit and Spur*, we were pleased to observe a striking likeness of our good friend Dr. John G. Rutherford, standing in an easy, happy attitude upon the judges' stand at the Ottawa Hunt Club race meet. The doctor was the center figure of a little group, with His Royal Highness the Duke of Connaught on his right; Mr. T. C. Bate, on his left, and Dr. R. E. Webster, M.F.H., to the right of the Duke.

REPORTS OF CASES.

POLIOMYELITIS IN THE HORSE?

By JOHN F. WINCHESTER, Lawrence, Mass.

On the 13th of October, 1912, a dog owned by Mr. E. A. K. made the acquaintance of a skunk. For a few days before this he did not act natural. He was about five years old, very fat, had been in the family since a pup.

The dog officer was called on the 14th and found him weak in the hind legs, but would stand and walk, although he did not have full control of the legs. Would respond to the call of the owner. No salivation, no snapping, not vicious, swallowed normal. When placed in the wood-shed, he did bite the door jamb and barked. When urinating he squatted like a pup. Did not in any way act excited, and did not rest when lying down; was uneasy.

The officer informs me that there were no symptoms to cause him to suspect rabies. When the officer gave him cyanide, he held the dog's mouth open with his bare hand. The officer was sent for, as the owner thought the dog had been poisoned, and the odor of the skunk was very marked.

After disposing of the dog, the owner was anxious to know if a disease in a dog could be transmitted to the horse. The officer said such could occur if the horse was bitten, especially if the dog had rabies. This opinion led to an examination of the horse, which was frequently loose in the yard, and barb wire was on the fence, and they found a scratch about the center of the upper lip, and superficial. The scar was about one inch long, and the owner considered this due to the barb wire.

The horse in question began to manifest symptoms that were first noticed soon after the dog was killed.

Mr. and Mrs. K. told me they were not sure that the dog bit the horse, which confirmed what the officer had told me.

This interesting case forms part of a report to the Director of the Department of Public Health and Charities of Lawrence, Mass., by Dr. John F. Winchester, in the capacity of Inspector of Animals of that city; and seems to point to the importance of microscopical examinations of the central nervous system, where clinical symptoms seem to indicate derangement of the nervous system.—[ED.]

As described by the owner to me, the horse would drive sideways, stagger, was languid and at times excited. These symptoms continued up to and including the week of November 3, 1912, when, in addition to the above, he would snap his teeth, salivate and drag both hind feet. About one week before the horse was shot he was newly shod, and then the toes of both hind-feet were worn so much as to attract attention.

The last week of his life the symptoms remained the same, although more marked, especially as regards the wearing of the toes of both hind hoofs and shoes. The owner informs me that he would carry his head high and, when left near a post, would rub his face. He drove him for the last time on the 15th of November, and then took the precaution to tie him, the first time in three years. This day he rubbed the side of his head severely and bit the rope in two.

The following day he became very excitable, hitting his head against the side of the stall, and was unsafe to approach or care for.

Report from the Pathological Laboratory, Massachusetts General Hospital.

Report of Microscopical Examination of Paraffin Sections from the Cerebral Cortex, Cerebellum, Medulla and Cervical Cord of a Horse for Dr. J. F. Winchester.—Sections from the medulla show much cellular infiltration of the adventitial lymph spaces of many of the blood vessels, and also aggregations of cells about some of the large nerve cells. Degenerative appearances in the nerve cells are not well marked.

Sections from the cervical cord also show cellular infiltration of the adventitial lymph spaces of the blood vessels, both in the gray and white matter, and also striking lesions in the gray matter, especially in the anterior horns. These lesions are in the form of foci of cellular infiltration, occupying areas several times the diameter of a large nerve cell. In the midst of these foci, nerve cells may be seen. In one of them a large nerve cell is present, showing hyaline changes, an irregular outline, and indentations produced by the cells which surround it.

The cells infiltrating the adventitial lymph spaces and aggregating about the nerve cells and in the foci in the cervical cord are of several kinds. Most of them cannot be distinguished from small lymphocytes; some have resemblances to plasma cells; some are larger and apparently represent the polyblasts of Maximow.

Their nuclei are often fragmented. No polymorpho nuclear leucocytes can be positively recognized.

Sections from the cerebral cortex and cerebellum show no definite lesions.

No signs of meningeal inflammation observed in any of the sections.

Negri bodies so characteristic of rabies are not to be found in any of the nerve cells.

It is impossible to make a definite diagnosis from these findings. While lesions similar to these have been described in rabies, they have been shown not to be diagnostic of that disease, but to occur in other diseases as well, especially in the acute stages of poliomyelitis. The absence of Negri bodies points strongly against rabies, but does not absolutely exclude it. The similarity of the lesions in these sections to those found in poliomyelitis is very striking, and the possibility should be seriously considered that this is a case of that disease in a horse, although the spontaneous occurrence of it in this or any other animal is not yet recognized.

(Signed) JAMES HOMER WRIGHT.

TRAUMATIC PERICARDITIS.

By BRUCE M. WALLACE, D.V.M., Bergen, N. Y.

On the morning of June 5th I received a call to come and see a cow, which the owner said was off her feed. It was only a short distance from town, so I was not long in getting there. On arriving I found a fine specimen of a Holstein cow, 8 years old and weighing about 1,000 pounds, standing in a stanchion, with the nose resting on the floor; respiration 25, temperature normal, pulse 60 and intermittent. A swelling was noticed between the rami of the inferior maxillary bone, and also a swelling of the dew-lap, which would pit on pressure. Auscultation over the heart revealed a gurgling sound. Appetite was just fair, and the animal in good condition. The case was diagnosed as one of traumatic pericarditis, telling the owner that treatment was useless, and that the cow could then be used for food. He doubted my diagnosis and wanted her treated. I complied with this request, giving 1½ pounds magnesia sulphate, applied mustard to the sides and put the patient on a good tonic. I again advised the owner to butcher her, informing him she would be dead in four weeks. She lived five weeks, and I asked

him if he would let me know when she died, which he did, and I went to his place and held a post mortem. I placed the animal on her back, removed both of the fore-legs just as close as I could to the ribs, then took out the ribs, opening the entire thoracic cavity without disturbing the diaphragm. I then took a large knife and followed down the anterior surface of the diaphragm about half-way, when the knife struck something gritty. I told the farmer there was his nail or piece of wire, whichever it may be; and he pulled it out himself—an eight-penny finishing nail. He believed now what he doubted before. The pericardial sac was as large as a half-bushel basket and filled with a dark colored fluid; the heart was soft and flabby, and the tube through which the nail worked contained a very thick pus. The lungs were also inflamed, but all other organs normal.

THE CORNELL VETERINARIAN, Vol. II, No. 2, reached us early in January, and in addition to some excellent moral teaching and other valuable matter editorially, contains some excellent articles by prominent members of the profession, the name of Dr. David W. Cochran, President New York State Veterinary Medical Society, heading the list.

HORSEMEN AND VETERINARIANS CO-OPERATE TO SECURE STALLION REGISTRATION LAW.—The following clipping from the *Breeders' Gazette* suggests a co-operative spirit between the veterinarians and the horse breeders in Oklahoma. "In recent years Oklahoma has been a dumping ground for scrub stallions and quack veterinarians. Owing to the laxity of the laws in that state there has been no way to prevent this unfortunate condition. The legislature convened January 7. An effort will be made by Oklahoma horsemen and veterinarians to secure the passage of a stallion registration law, patterned after the ones which have been so successful in checking the use of unsound and badly bred stallions in the North. The State Veterinary Medical Association, of which C. E. Steel, Oklahoma City, is secretary, will also push a bill for the protection of the qualified veterinarian. These measures deserve support because they look toward improvement in horse breeding, and a higher grade of professional assistance for stockmen."

DISTINGUISHED VISITORS.—On December 31 we were honored by a call from President John R. Mohler, of the A. V. M. A., and Dr. John Reichel, of Glenolden, Pa., the gentlemen being in attendance at the meeting of the Society of American Bacteriologists, which was then in session in New York City.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Case of Double Iliac Thrombosis [*W. Hunting, F.R.C.V.S.*].—The record of a bay gelding, which having exhibited all the evidences of this affection, was destroyed and presented at the postmorterm the following conditions: Heart appeared a little larger; circulatory system free from parasites; thrombosis commencing about 1½ inch in front of the origin of the external iliac; the artery on the off side was most seriously involved, and in it the thrombosis could be traced down the leg to where the femoral artery crosses the shaft of the femur. A similar condition was also found on the artery of the opposite side. The internal iliacs were thrombosed on both sides, but that of the right side the most extensively. All the branches given off from these two vessels were also diseased. Likewise was the middle sacral.—(*Vet. Record.*)

Lesions on Penis of Stallion [*J. H. L. Lyons, M.R.C.V.S. and R. P. Jones, M.R.C.V.S.*].—Entire chestnut is reported having sores and ulcers on the penis, observed during copulation. There is no swelling nor heat of the sheath. When the penis is extended or in erection there are on the anterior fourteen inches about, of the near side, some vesicles and ulcers. The glans penis is normal. No trouble in micturating. The vesicles contained clear fluid. The ulcers are shallow and contained little yellow pus. Dourine was suspected. But as the fore legs had been blistered some days before, and as there were no cutaneous placques, and a negative microscopic examination of the blood, the case was considered as due to brushing of the penis against the blister. In thirty-six hours every bad symptom had disappeared.—(*Vet. Record.*)

Enormous Renal Tumor of a Horse [*S. J. Hewitt, M.R.C.V.S.*].—Concise record of a case of colic in a mare, which had died and where at the postmortem an enormous tumor was found under the right side of the loins, involving and com-

pletely surrounding the kidney. It weighed exactly 106 lbs. The specimen proved to be a neuro-carcoma.—(*Vet. Journ.*)

INTERESTING FRACTURE OF THE TIBIA IN A MARE [*W. Lothian, M.R.C.V.S.*].—Mare is very lame, because of a kick on the inside of the leg, although there was no mark. Fracture without displacement is diagnosed. The animal is put and remained in slings for five or six weeks. When taken out and walked, there was noticed a certain abnormal movement. After some time, the mare was put to grass but yet remained lame and entirely unfit for use. She was destroyed. The postmortem revealed a "fracture involving the joint, and consists of the anterior tuberosity for 6 inches or so down the bone and embracing nearly one-third of the surface of the bone." Great deal of fibrous tissue had formed and held the fractured part in position.—(*Vet. Journ.*)

SEPTIC METRITIS FOLLOWED BY RENAL ABSCESS [*E. Wallis Hoare, F.R.C.V.S.*].—Great Dane bitch had a litter of fourteen pups. Four days after had one more dead. This is followed by symptoms of illness with a temperature of 106° F. Tense abdomen, frequent straining, abundant stinking vaginal discharge; vaginal examination negative. After two days a deformed, decomposed pup is got rid of. A slight improvement is the result, but soon the rigors returned and the temperature goes up to 107° F. Antistriptococcic serum is given. Uterine disinfecting injections are kept up. Then came up a series of fluctuations in the temperature. The slut began to pass blood in clots when urinating, she lost considerable flesh, showed loss of power behind and was destroyed. *Autopsy:* The left kidney was enlarged and was tumor-like. A large abscess existed in the cortex containing a great amount of bright green pus. The kidney weighed 10½ ounces. The right organ was also enlarged and weighed 9 ounces and 2 drachms. The uterus showed thickening of the mucous membrane.—(*Ibid.*)

SARCOMA OF THE OMENTUM IN A SPANIEL [*By the same*].—Six-year-old, small sized spaniel bitch has lost condition and gradually her abdomen has grown larger. It is indeed much distended and looks ascitic. Puncture of the abdomen gives free hemorrhage. Destruction was advised. A tumor was found in the abdomen filling up the entire abdominal cavity, the viscera being pressed upwards towards the spine. The tumour was movable, soft in consistency, and weighed 3 lbs. 7 ozs.

There were also small white growths on the peritoneal surface of the diaphragm and on the spleen. The neoplasm proves to be a round-celled sarcoma of the omentum.—(*Ibidem.*)

Foot and Mouth Disease in India [*E. W. Oliver, Super. C.V.D.*].—That disease is known in India by many names, among the chief being Khur-pakka, Nuh-pakka Khura, Bekhra, Chhapra-pakka, Khoosita, Pairana. As the relative price of cattle is so small there is no need for the serious view of the matter as necessary at home. Animals are treated with sulphate of copper baths, through which they are driven twice a day. The mouth is washed with alum, borax and carbolic acid. When the feet are first affected, to prevent the mouth becoming infected, the feet are encased in leather bags to prevent rubbing the vesicles with the lips and gums. Foot and mouth disease is almost constant in India, and is not treated as a serious disease by the owner except at the busy time of harvest, when working oxen may be put out of action.—(*Vet. Record.*)

Ascardies Suilloe in the Peritoneal Cavity [*R. Bennett*].—A ten or eleven weeks' old sow, in good condition, seems not to be very well, refused her food, and is found dead the next morning. On opening the abdomen a dozen or so of worms Ascarides Lumbeicoides, in the peritoneal cavity. They were alive and distributed all over the abdomen, some between the coils of the intestines, one was on the posterior face of the liver. There was lesions of general peritonitis with deposits of yellow lymph-like exudate. The intestines were much inflamed and all the coats thickened. No perforation was found to explain the exit of the worms from the intestinal canal.—(*Vet. News.*)

FRENCH REVIEW.

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

Diaphragmatic Hernia [*Mr. Bigot, Army Veterinarian.*] —*Violent,* gelding of 11 years, has intermittent colic which lasted several days. After two weeks, the respiration is accelerated, auscultation and percussion are negative, except some dullness on the left side, with hypersensibility of the costal wall. Exploration with puncture is negative. Violent borborygms are heard in the thorax, and diaphragmatic hernia suspected. This condition lasted for about a month. The attacks of colic are more severe and are not relieved with morphine. Temperature

rises to 39° 2C. The animal dies. *Postmortem:* Two or three litres of yellowish serosity in the abdomen; peritoneum extensively congested. The whole intestinal mass has an abnormal aspect, the coecum is right across the abdomen and is twisted in spire upon itself, the large colon has also assumed a transversal direction; the liver is the seat of a passive congestion, and under its left lobe appears a very large laceration of the diaphragm, running vertically down and measuring 25 centim. Through it the small intestine has passed into the thoracic cavity, congested and of color varying between a bright red tint and a dark purplish gangrenous hue. The stomach and spleen also in the chest are pressing against the left lung, which is squeezed, congested, hepatized here and there. The pleura and pericardium were inflamed. The heart showed lesions of acute endocarditis. *And with all that, the horse lived nearly* 40 *days.*—(*Journ. de Zootech.*)

Suture of the Lower Jaw in a Slut [*Dr. Rousscl*].—Four-year-old slut, weighing 6 lbs., falls down a pair of stairs and breaks her lower jaw, between the last two molars. There is displacement, one segment overlapping the other one-half a centimeter. The only possible treatment is the suture. The slut is chloroformed. The segments of the maxillary are perforated below the last two molars, the pieces of this bone are well adapted together and a big silver wire passed through the drilled holes, keeps them in place. By the next day the little slut can take nourishment, and after fifteen days consolidation is strong.—(*Bullet. de la Soc. Cent.*)

Radical Operation of Fibro Sarcoma of the Face [*By the same*].—Dog five years' old had a fibro-sarcoma of the face. The orbital fossa is partly invaded by the tumour, which, while it projects outwards, has ramifications on the internal face of the superior maxillary and the palatine bone. The last upper left molar is surrounded by neoplastic tissue. There is muco-purulent discharge from the left nostril and left eye. Saving a large fold of the skin, the maxillary sinus was entered and minutely curetted. The left molar extracted, the superior maxillary and palate bone were scraped thoroughly. The large cavity left was packed the first day with iodurated solution and big drainage tube inserted. The nasal discharge stopped immediately after the operation. Cicatrization went on rapidly, and on the 16th day the animal went home cured and without

a visible mark of the operation. Two months after his health seemed to be perfect.—(*Bullet. de la Soc. Cent.*)

Colo-Rectal Invagination of Dog [*Adjunct Prof. R. Lesbouyries*].—This was in a year-old fox terrier. He suddenly stopped eating, vomited, passed bloody feces and his condition alarmed the owner. The dog seems gay, has normal temperature, but the mucosa are pale. The abdomen is slightly painful. The dog remains in its kennel, quiet, but shows himself gay when he is approached. His appetite is gone, the tongue is coated, his walk is staggering. The nausea, vomiting and expulsive straining are gone. The feces remain the same, then he passes blood, mixed with pieces of straw. Rectal examination is negative. The loss of flesh is very great, muscular emaciation well marked. Careful examination of the thorax and abdomen gives no clue to a diagnosis. Death finally occurred without agony. Postmortem revealed lesions of slight colitis and a colo-rectal invagination. Ten centimeters of invaginated organ are of red brownish hemorrhagic color. The mucosa of the rectum was ulcerated on a surface measuring 4 or 5 centimeters.—(*Rev. Veter.*)

Generalized Tuberculosis in a Calf [*Mr. A. Chaillot*].—A fifteen-day-old calf has a swelling of the left testicular region. It is warm, painless, firm in consistency and movable towards the epididymis. The animal is in good condition, has good appetite, he carries his left hind leg in abduction when walking. Orchitis is diagnosed and prescribed for. After a few days the condition instead of improving grew more serious and the owner decides to send the calf to the butcher.

At the postmortem, besides a marked generalized tuberculosis, a localization of the disease is noticed on the left testicle. All the glands of the body are diseased—the parenchymatous organs are free. The left testicle is three times its normal size. There is no trace of suppuration. The prostate gland was also tuberculous. The tuberculous orchitis has been noticed only once in a boar by Mousseau.—(*Rev. Veter.*)

GERMAN REVIEW.

By John P. O'Leary, V.M.D.

At a recent meeting of the Berlin Academy of Sciences, Professor Orth discussed the question of bovine and human

tuberculosis. The progress made in the direction of research work, the relation between human and bovine tuberculosis was described and demonstrated. Facts were brought forth to show that the number of human beings infected through the bovine bacillus was very large; that from the standpoint of human pathology and hygiene, some means should be adopted for the eradication of bovine tuberculosis. This line of work should be directed chiefly against the bacterium in food stuffs, particularly that derived from tuberculous sources. According to Orth, human infection through contact with the organism of pearly disease is much more frequent than can be approximately determined.—(*Berliner Tierarztliche Wochenschrift,* No. 9, 1912.)

Brief Report Concerning Pantopon [*Veterinarian Nagler Munchen*].—In cases of canine distemper, attended with intestinal and gastric complications, the author injected an opium preparation, "Pantopon." Small dogs were given 0.1 to 0.2 grams of a two per cent. solution subcutaneously; large dogs were given proportionately larger doses, 0.5 grams. When the maximum dose was administered, and in some instances after the first injections were made, vomiting was produced, but this did not occur after subsequent doses were given. Two to three injections were sufficient to effect a cure.—(*Münchener Tierarztliche Wochenschrift,* 1911, *No.* 29.)

The Application of Pix Liquida for Navel Disinfection [*District Veterinarian Bichlmeier of Weiler*].—For many years Bichlmeier applied exclusively pix liquida for navel disinfection. Immediately after birth the navel string was smeared throughout its entire length as far as its entrance to the abdomen with tar for three successive days. The application of tar in every instance averted infection. Excellent results were obtained by the author in this manner in large cow-barns, where for years past great mortality prevailed among calves, owing to infection of the navel, and where all possible experiments failed to eradicate the infection. Since the application of tar was practiced in these barns the evil has entirely disappeared.—(*Münch. Tierarztliche Wochenschrift, No.* 13, 1912.)

Digalen, a Specific in the Treatment of Haemoglobinaemia of the Horse [*District Vet. Johann Furthmaier in Brixen*].—Furthmaier calls attention to the fact that, according to his experience, digalen has a rapid and effective action not only in severe cases of pneumonia, but also in haemoglobinaemia.

Veterinarian Kofler also corroborates this statement with regard to the action of the drug. Both practitioners prescribed and used digalen in the following manner. In cases of extreme restlessness, with profuse perspiration, a solution containing 0.5 grams of morphine hydrochlorate is injected subcutaneously; after the symptoms of uneasiness subside 15.0 grams of digalen are given subcutaneously. In two or at most four hours after, the horse is able to stand up and remains standing, apparently at ease. Only in rare cases is it necessary to repeat the treatment on the following day. The dark color of the urine disappears gradually.—(*Tierarztliche Centralblatt,* 1912, *No.* 25.)

Observations and Investigations Concerning Infectious Ostitis and Osteomyelitis in Cattle and Horses [*Dr. Alfred Baumgarten, Interlaken*].—As a result of his observations, the author arrives at the following conclusions:

1st. There occurs among horses and cattle a very painful ostitis and osetomyelitis, presumably due to the necrose bacterium alone, or in symbosis, with a grampositive coccus.

2d. That the same produce a constant state of agitation of a pronounced character, a paralysis with tendency to seek support, frequency of the pulse, and often accompanied by fever.

3d. In some cases abscess formation.

4th. The disease has a most destructive influence on bone tissue without a reactive osteophytic formation. Consequently the regeneration of bone tissue was never observed.

5th. The course of the disease is of a lingering character, and chronic.

6th. The iodine preparations supercede all others in the treatment of this disease.

7th. Up to the present time, these diseases were occasionally considered of a rheumatic nature.—(*Schweizer Archiv. fur Tierheilkunde,* LIII. Band, 3. Heft.)

Concerning the Adrenalin Therapy in Morbus Maculosis of the Horse, and in Parturient Paresis of Cattle [*By George Lichtenstern in Rottalmunster.*].—The author recommends the use of adrenalin in morbus maculosis of the horse. He cites two cases in which repeated intra-muscular injections of 10 c.c.m. adrenalin (1-100) were given in the side of the neck, resulting in rapid recovery. In parturient paresis of cattle the author used adrenalin. In order to effect a cure the infusion

of air must be used freely in conjunction.—(*Münch. Tierarztliche Wochenschrift,* 1911, No. 18.)

A Practical Method of Administering Fluid Medicaments to the Horse [*By Combaret*].—The administration of fluid medicines to the horse is always a tedious process, and very frequently the animal refuses to swallow the fluid, so that the greater portion is lost in running out the sides of the mouth. The author describes the method which he has adopted for many years, and which has given him entire satisfaction, as follows: The head of the horse is fastened in the usual manner and held at a proper elevation. The operator stands upon an object of sufficient height to enable him to pour the fluid into the mouth from one side, the neck of the drenching bottle is placed over the tongue; when a sufficient quantity of fluid is in the mouth, and when the horse will not swallow, an assistant pours a small quantity of clean, luke-warm water into the nasal chamber. The water coming in contact with the sensitive nasal mucuous membrane immediately produces a reflex action which results in the involuntary swallowing of the liquid in the mouth. This manipulation is to be repated until the whole dose is swallowed, and not a drop is lost in consequence. It is important to note that only a small quantity of water is to be used for nasal irritation—about three or four teaspoonfuls. As soon as the animal has swallowed the contents in the mouth, the trickling of the water into the nasal chamber should cease immediately. —(*Berliner Tierarztliche Wochenschrift, No.* 12, 1912.)

Annual Smoker of Veterinary Medical Association of New York City.—The popularity of these annual gatherings with veterinarians of Greater New York and surrounding states has pretty clearly demonstrated the need of relaxation of that kind by men closely confined to the exacting duties that their calling demands of them. So that at the last meeting President McKinney appointed a committee to arrange for such a function; and we are advised by Chairman MacKellar that it is to be held on Wednesday, February 19, in the "Beef Steak Garret," Reissenweber's, Fifty-eighth street and Eighth avenue. Excellent talent has been secured, and a good time is assured. Tickets may be procured from Drs. R. W. MacKellar, 351 West Eleventh street; Maffit Smith, 43 West Ninetieth street, or C. Rhorer, 128 West Fifty-third street.

CORRESPONDENCE.

NERVOUS AND INTESTINAL ATONY IN CATTLE FROM UNCERTAIN CAUSE.

Worms in Proteid—Hypersensitizing?

Editor American Veterinary Review, *New York:*

I would be very much pleased for your opinion of a disease among cattle I've had in 1911 and 1912, latter part of August and September, about the same time both years.

History. 1911—One farmer, pasture low land with several swamps and timber; one crude oil well and one gas well in pasture, not operated; lost three cows and one bull. Called in Assistant State Veterinarian and B. A. I. employee; concluded to call it malaria from stagnant water, although were watered night and morning from well, but had access to the stagnant water. Food all examined and apparently best. Flies and mosquitoes worst I ever saw.

1912—Same farmer lost two or three and treated three or four others successfully. Same condition as 1911, only flies and mosquitoes worse. One neighbor lost two, same symptoms, not treated; also low land. Another farmer, high lands, hilly pasture, running spring water, lost six so far; last two treated unsuccessfully. Looked carefully for ticks several times; none found. This farmer on hills bought several head from neighbors also on high lands but none from stock yards.

Symptoms—Pulse 90-130; temperature, 100-101½° F.; peristalsis ceases; no intestinal nor gastric fermentation; anorexia sets in only from 24 to 48 hours before death. Examining the herd in pasture, would find the pulse to be the first symptom, some apparently well with pulse 90. Marked anæmia of all visible mucous membranes, as in a fatal case of hemorrhage, becoming paler as case progresses. After pulse reaches 100 and anorexia present, they die in from 6 to 24 hours. About two-

Note—The Review editor being confirmed in his opinion by one of the collaborators engaged in cattle practice, that the symptoms described in the above query were out of the ordinary, submitted it to one of the profession's highest authorities, whose answer, following Dr. Michael's inquiry, will be found most interesting and instructive reading, and furnish an abundance of food for thought.

thirds treated while still eating and pulse not over 85 would recover, with full doses of quinine, digitalis, nux, and Spts. Frumenti.

Post-Mortem Lesions—Subcutaneous and visceral regions in an anæmic condition; lungs normal; liver slightly more yellow than normal, and little softer; gall bladder enlarged, filled with very thick, flaky gall; spleen soft and pulp darker in color; ingesta normal except in abomasum a little dryer than normal; kidneys normal; bladder and urine always normal. *Circulation:* Heart muscle blanched; patches of ecchymosis on pericardium; left ventricle and auricle filled with large, tough, reddish clot extending into blood vessels for about 18 inches; right ventricle and auricle filled with dark, tough clot. At ends of clots an amber jelly-like mass not so tough; these clots cut about like normal liver. Bones normal, brain and meninges bleached. Post mortem held about six hours after death. Might it be some protozoa inoculated by flies or mosquitoes?

Yours very truly,

Dr. L. B. Michael, Collinsville, Ill.

REMARKS BY PROFESSOR LAW.

In a second letter from Dr. Michael he gives the following additional points:

The oil and gas wells were on one farm only; the disease occurred on three farms.

A large *lead smelter works* is operated 3 to 6 miles from the farms, and near this, several horses and cows have died from the arsenical fumes.

The farmers haul no manure from the city, therefore this source of lead may be excluded.

Cattle are the only animals affected. Dr. M. does not believe they go near the wells. Sex and condition seem to make a difference.

As cool weather set in the disease disappeared. Emaciation is not evident. Pulse rapid, 90+ from the first. Breathing is only accelerated in the very last stage. There is no uneasiness, pain, nor anorexia at first.

Necropsy shows very extensive blood clots. Dr. M. estimates from this that one-fifth of the peripheral blood supply had been used up in this way before death.

There was no microscopical examination made of anything.

There was a complete absence of peristalsis, yet the abdomen

felt normal on palpation. One farmer gave 6 pounds *Sodii sulphas* to a patient with no result. To two cases in the advanced stage Dr. M. gave physostigma-pilocarpin compound without effect. Both died about two hours after.

It may be well to here deal shortly with different supposed causative factors:

1*st. Arsenical Poisoning*—This in certain chronic forms has been found to be associated with fatty degeneration and muscular atony or even paralysis. But beside the distance from the lead smelter (3 miles and upward), arsenic is discredited by the following considerations: (*a*) The Collinsville disease is confined to cattle, whereas the arsenical precipitate would have affected other herbivora on the same pastures and especially on such as were closer to the smelter; the Collinsville disease is confined to a month of the hot season instead of continuing through the year, or the season of pasturing, as with an arsenical precipitate; the Illinois disease rapidly develops to a fatal acuteness following its first manifestation, whereas the arsenic from the smelter would have rather caused a slowly advancing affection as the poison accumulated; in the two successive years (1911 and 1912) the malady has been shown in the hot autumn months only, and in 1912 after the heavy rains of August, when the poison should have been largely washed off from the vegetation; finally, the symptoms don't agree with those of acute arsenical poisoning which usually eventuate in mucous gastro-enteritis and diarrhœa as stated by Dr. M.

Lead Poisoning—This is more probable than the last, as plumbism causes spasms and even paralysis not only of *voluntary muscles* but even of the *involuntary muscles* of the bowels, womb, etc., and is habitually productive of obstinate constipation as in the Collinsville affection. The same objections may be made to lead poisoning as to arsenical poison from the smelter. Dr. M. is positive that no city manure has been put on the lands, so that we must apparently discard the idea of paint, paint-pot scrapings, sheet lead, oil cloth, leaded papers, etc., which might be admitted through such a channel. There remains the lead and cotton waste packings from the oil and gas wells, though these have not been operated for some time. The paint used in such joint packings is not altered by time nor exposure, and it is no uncommon thing to find that it has been turned under by the plow one year and plowed up and left on the surface one, two or three years later, so that the cattle chew and swallow it to their own undoing. Cattle, especially cows, have a special penchant for chewing non-

alimentary matters, so that apart from the sweetness of certain lead compounds (acetate), they are exposed to plumbism above other domestic animals. Dr. M. does not think the cattle went to the wells, but evidently the way was open for them to go if they chose, and it would be rather surprising if they never did. The probability that the lead was the toxic factor is, however, much diminished by the fact that the disorder occurred in two successive years on three farms, whereas the suspected wells were only on one of them. If the fences were good, this seriously discredits the wells as a source of the poison. There is the further drawback that, when lead poisoning proves so rapidly fatal as in the cases before us, there are usually such marked symptoms of nervous disorder (dullness, stupor, clonic spasms, bellowing, delirious dashing about, pushing against a wall or other obstacle) as can hardly be overlooked. But it is such a common experience that the lead has been introduced in an unsuspected way that, in any future cases, a careful examination should be made of the contents of the stomachs and analysis of these, the liver and spleen, so as to exclude this possibility and narrow the inquiry down to other channels.

Narcotics—Among narcotic plants we have a long list, indigenous or acclimatized, which should be looked for in the pastures where animals suffer. I may name crowfoot, milkweed, sneezeweed, aconite, veratrum, larkspur, poppy, belladonna, hyoscyamus, thornapple, lobelia, conium maculatum, cicuta virosa, potato tops, sunned (green) potatoes, lily of the valley, yew, poison ivy, poison sumac, spurge and narrow-leaved laurel, etc. Poisonous ryegrass or darnel is always injurious, but many of the grasses and legumes are likely to be dangerous only when ripening. Thus ripening ryegrass has long been associated with staggers in horses and cattle in Europe; the same is shown to a lessened degree in the different small grains, millets, and notoriously so in vetches, lupins, peas and various trefoils.

Forage Poisoning; Cryptogamic Poisoning—This brings us to the question of analogy with the *Kansas equine enzootic* of the past year (1912). It is true that horses only suffered in Kansas, and cattle only in Illinois, but the two outbreaks agree perfectly as to date of appearance and time of prevalence, in that they both followed a wet spell, prevailed during the hot weather, and subsided abruptly on the onset of cold. Both involved the nervous system and showed a remarkable intestinal atony, and both are said to have been attended by extensive ante-mortem blood clots and consequent embolism. Horses suffered more

from cerebral disorder, while cattle had early circulatory excitement and rapidly advancing anæmia. *Forage poisoning* appears to have been extensively prevalent in adjoining states as Iowa (Dimock) and Nebraska for years past. It is a convenient name under which may be included a number of different forms of poisoning due to various diverse factors. Even if we change the name to *Cryptogamic poisoning*, it helps little in this respect, as the cryptogams growing on or in forage are multifarious, and the identification of each, with its resultant symptoms, remains an important desideratum. Besides, it is a common experience that the pathogenesis of a cryptogam often varies according to its stage of growth, to the environment in which it has been grown, to the abundance or paucity of light and air supplied, and to the food, etc., of the victim. It follows that it may vary according to the genus or species of animal upon which it operates, and to the constitution, condition, food, etc, of such animal. The complexity of the subject, the imperfection of the knowledge as yet in our hands, and the discrepancies in the records of observations on particular cryptograms, make the field an uninviting one; yet it is well to know that two reports on the action of the same cryptogam, which seem to be mutually contradictory, are not to be taken as indicating that the pathogenesis described in the one is to be absolutely rejected. It may mean only that the conditions have been different in the two, and that in identical conditions the results would have been the same. The difference in results may indeed be of the highest value to the careful investigator as opening up new truths through a study of the varying conditions. In this, too, we find an explanation of the notorious fact that a spreading disease carrying a rapidly advancing destruction like the *Kansas equine affection* will promptly undergo arrest and rapidly disappear without obvious cause.

The recent Kansas outbreak reminds me forcibly of an experience which I had in the Sunflower State in the early '80's. The whole country was suddenly startled by the report of an outbreak of *foot-and-mouth disease* in southeastern Kansas. I was at that time chairman of the U. S. Treasury Cattle Commission, but was well satisfied by the published reports that the trouble was the old and well-known *gangrenous ergotism*. I did not feel justified in spending government money in personally visiting the afflicted state to investigate a delusion that must very soon collapse like the bubble it was, and show its own insubstantiality. But the delusion spread rapidly and gained impetus as it extended. The state veterinarian and a veterinary commissioner

from Canada agreed that the malady was the genuine *foot-and-mouth disease*. The Governor quarantined the affected herds, other states were preparing to lay an embargo on all Kansas ruminants, Kansas live-stock industry was threatened with temporary ruin, the enormous domestic trade of the country bade fair to be seriously injured, and the next step could not fail to be the exclusion of American live stock by outside nations. I felt now that the mistake was becoming a national calamity and that I could no longer resist the renewed and increasingly urgent request of Judge French, Assistant Secretary of the Treasury, that I should go west to the seat of trouble at once. I accordingly went and found, as I expected, a very imposing exhibition of *gangrenous* destruction of distal parts. Whole herds were affected so that infection had been a plausible explanation and too easily and universally accepted. Some had necrotic sores around the coronets which had been sunk in the black mud of the spring thaws; others had the hoofs separated and either shed or semi-detached from the *quick* which showed the beginnings of the necrotic processes; others were sloughing, or had already sloughed off the digits at the fetlock, or the limb through the lower or upper metatarsal region; others were shedding the withered tips of the ears or tail; others had small necrotic sores on the lips or buccal mucosa. But at no point were there the large vesicles, covered by cuticle and with serous contents, as in *foot-and-mouth disease*, and in no case did sheep or swine suffer though kept in the same muddy yards with the stricken cattle. Horses, when affected at all, showed only the small necrotic sores on the buccal mucosa. There was no room for doubt that the public scare was the result of an error, but the error had got the start of the truth, it had already secured the ear of authority, of the general public, and of an antagonistic trade competition. Truth was placed in a woeful minority and the errorists were very confident in their position. It was evident that a demonstration was necessary to carry conviction not only to the general public, but even to the veterinarians who had fallen into the mistake. I therefore inoculated sheep, swine and new-born (sucking) calves, and, after two days' interval, obtained no trace of infection or inflammation at the points of inoculation. The demonstration having been successfully accomplished, report was made to the Governor, the quarantine raised, and, with attention to the needful instructions as to food, the "*foot-and-mouth disease*" in Kansas was definitely ended. In the genuine foot-and-mouth disease invasion in 1908, mistakes of the same kind were common

and inevitable. In New York, in counties far outside the real area of infection, cases of *mycotic stomatitis* were reported as the infectious disease which, if accepted, would have subjected a great part of the state to quarantine and the live-stock industry to very heavy losses. In Delaware County, Pa., I stood beside the open trench dug to receive the carcasses of a considerable herd, which had been condemned as suffering from the pestilential disease because they bore on their mouths these spots of mycotic gangrene. In this case the condemned animals had come from Baltimore, West Virginia and Ohio, and if the error had not been corrected, and the stock saved from destruction, the contemplated act would have logically entailed the quarantine of the States of Maryland, West Virginia and Pennsylvania at least, and untold losses upon the American live-stock industry.

Cryptogamic Poisoning is the result of different non-flowering plants in different cases, and as such plants are often toxic, they are common objects of suspicion. Many, however, like the common field mushroom and its edible allies, are, when fresh, justly estemed as food. Our common yeast is almost indispensable to our modern civilization. Yet even this produces its narcotic alcohol and irrespirable carbon dioxide. The *monasces purpureus,* growing in silage exposed to air, has proved fatal to horses (Buchanan). Blue mould has been the supposed cause, on many occasions, of mycotic stomatitis and intense cerebrospinal disorder. Bitting found it especially lethal when complicated with fusarium. The other moulds at the period of their full strength, fed in spoiled grain, are credited with the loss of hundreds of thousands of dollars yearly. Ergot has been already referred to. Smuts under given conditions are similarly incriminated. Space would forbid a fuller list of these. Though not always equally poisonous, the specimens named and others of the same family groups are always to be dreaded when conditions favor toxic action and receptivity.

Bacteria Poisoning—Bacterial ferments and their products in grain and fodders are chargeable with similar troubles as those just laid to the charge of cryptogamic invasion. They have the same uncertainty in successive cases, often reaching a great potency, with a high mortality which may be maintained for a time and then suddenly disappear. The pathogenicity may also be dependent on the nature of the food furnished in the seed invaded, on the variation in the supply of air or sunshine, on the state of the weather, wet or dry, on electric disturbance, on the presence of other bacteria and their products, and on the suscep-

tibility of the animal exposed. It will be most interesting to notice the coccus which has been advanced as the cause of cerebro-spinal meningitis or the Borna disease in Europe.

Coccus, Diplococcus or Streptococcus of Borna Disease—This has been found in many outbreaks in Europe and America in the subarachnoid fluid of affected animals. It may be found as a gram positive *monococcus*, 0.6 m. in diameter and less frequently as a *diplococcus* (Siedamgrotzky), or, again, as a *streptococcus* with 6 to 9 cocci in the chain (Ostertag). It grows readily on a gelatine plate, forming a sharply circumscribed colony, the size of a linseed, raised in the centre, and of a dirty grayish white; also in bouillon producing turbidity with a flocculent appearance beneath. Cocci have been found in the blood as well (Johne) and in other domestic animals showing similar symptoms. It has been largely accepted as the essential factor in the disease and attempts at immunization by sera have been resorted to. The apparent temporary success of such a measure can mean no more than does the habitual, sudden subsidence and disappearance of the malady in the entire absence of such a resort. This characteristic feature of the disease is far better in harmony with the introduction of a poison from outside than with the modification of a bacteridian poison in the body. If the observer comes to the question with a preconceived opinion in favor of bacteridian infection as the essential cause, he finds much to accord with the idea. But is the mere presence of a germ absolutely conclusive? Does similarity of the germ in two different outbreaks prove the identity of the two germs? Does a wider acquaintance with the disease sustain or lessen confidence in the constant and essential potency of this germ factor? In answer we may quote, 1st, the difference in physical or evolutionary structure of the germ found in different outbreaks—a *monococcus* (Siedamgrotzky, Schlegel), *diplococcus* (Johne, Marcq, Wilson, Brimhall, Christian, Weichselbaum, Ostertag), *micrococcus* (Wilson, Brimhall), *streptococcus* (Ostertag, Streit, Grimm). If it is claimed that all are spherical and that the distinction depends on the promptitude of separation of the individual cocci (before or after the formation of the chain), it must still be conceded that this difference of form constitutes a clear distinction, and it is for the advocate of identity to show why in the same temperature and environment (circulating blood, cerebro-spinal fluid) there should be these different forms in different outbreaks. It is not due to a difference in genus of the victim, is it then to a difference in the blood and spinal fluid from food, water, concurrent disease,

peculiar individual metabolism, special quality or amount of secretions, or to the presence of another germ (as when *Bacillus acidi lactici* enhances the potency of *Bacillus anthracis*). 2d, There is a wide difference as to the certainty of the asserted propagation of the disease by giving or inoculating the alleged germ in successive outbreaks. It has been assumed that infection is introduced casually in food or water, but this is but an inference, there is no experimental demonstration of such a result. Hutyra says the disease is not transmitted directly from animal to animal. As regards susceptibility, he places the horse first, followed by the sheep and at a greater distance by the ox, while swine and dogs prove resistant. Susceptible animals are not readily infected when the germ is administered by the mouth, nose, alimentary canal, subcutem or even intravenously, but much more frequently when injected under the dura mater. In the last-named method there is the risk of mechanical injury or complex infection. 3d, Hutyra further assures us that an animal recovered from an attack has no immunity against a future invasion. This agrees much more perfectly with a simple poisoning (cryptogamic or chemical) than with a bacteridian infection. If established, it would put artificial immunization out of court, for, however the animal system becomes habituated to and tolerant of poisons, this tolerance does not rise to the degree of obviating entirely the toxic action of an excessive dose. It certainly forbids us to accept the theory that the sudden cessation of new cases is due to a tolerance induced by a first attack. It turns the observer back to seek, in cryptogamic or other poison, the explanation of the sudden destructive outbreak, and its equally sudden ending. 4th, If the theory of bacterial infection must be accepted, its advocate must explain the absence of the disease through the great heats of summer and until the end of July or August, and no less its disappearance in September, before the really cold weather has set in, in the latitude of Kansas or southern Illinois. 5th, If he should appeal to rain as well as cold, he must show how a microbe, living and multiplying in the animal body with a blood temperature of 99° to 102° F. constant all the year, is to be affected by outside conditions. In Germany cases are reported in January and February, rising to large numbers in May and June and gradually decreasing through the third quarter of the year. This is on a latitude much higher than that of Kansas, Missouri, Iowa or Illinois. 6th, Flies and other predatory insects may be invoked as carriers of the germ, but these do not delay their yearly advent until August and do not cease their attacks in September.

Protozoa—Dr. M. questions whether a protozoon carried by insects may not explain the Collinsville disease? Located as this place is on a line of rail, a short distance east of St. Louis, it would not be surprising if the fever tick bearing the *Piroplasma biguminum* should have been dropped in the pastures. The disease occurred at the right season, produced the requisite anæmia in the victim, was sufficiently fatal, and subsided after a heavy rainstorm which habitually interrupts the activity of the tick and might seal its fate and arrest the disease if followed by cold. But there was an absence of ticks on the cattle; there is no evidence of engorged spleen nor enlarged liver; the high temperature of Texas fever is wanting; the remarkable intestinal atony and constipation are not characteristic of Texas fever, nor is the coagulation of the blood before death. Another *protozoan* disease of cattle known to exist in this country is the *chronic Texas fever associated with the round Anaplasma marginale* in the blood, but the absence of Southern cattle and of the ticks virtually decide against this, even if the Collinsville disease had been more chronic and less fatal. The *Trypanosoma Americana* is common in American cattle, but so far no visible illness nor fatality has been found to attend its presence. Next to these should be named *Coccidiosis*, but severe cases of this are usually seated in the bowels and give rise to a *red diarrhœa*, exactly the opposite of the condition in the Collinsville disease. Cattle have been so often exposed to the *malarial* parasites affecting man without any evil result that we may dismiss the question of this at once.

Blood-Sucking Worms—Dr. Rogers, of Manhattan, is strongly of the opinion that the *Kansas horse disease* is the result of the wandering larvæ of the *Strongylus armatus* (*Sclerostoma equinum*) and the resulting clots and embolisms of the arteries. The worms have been found in the blood and coagula in the arteries of the brain and lungs as well as of the abdomen. But he fails to note that these larval worms are found everywhere where the mature worms abound, yet a long experience with such verminous epizootics of the most severe and destructive types has failed to show elsewhere outbreaks with the symptoms and lesions of the Kansas disease. One swallow does not make a summer, and one or ten cases of arterial brain embolism, even if larvæ are found in some of the clots, will not prove that 20,000 or 30,000 horses died within two months from the wanderings of these larvæ into the brain and lungs. We have seen high-class breeding studs affected with severe strongliasis, where emaciation, anæmia, stunted growth, cachexia, rachitis, marasmus, and even

verminous colics were common, but they developed no such continuous line of cases showing the nervous and pulmonary attacks of the Kansas victims. In a pure parasitism of this kind, is it conceivable that all cases in Kansas should take on this form, while everywhere else they take on other symptoms? Something in addition to the parasites must be found in the Kansas cases to explain the interesting anomaly. Whatever this superadded pathogenic factor in the Kansas outbreak may turn out to be, we may rest assured that such a factor was present. The symptoms and lesions recorded have from the first suggested one or other of the cryptogamic poisons, and it would not be surprising if this should be the final verdict.

Protcid Poisoning—Dr. Rogers' arraignment of the strongles, however, suggests to us another probable explanation in which the blood-sucking and migrating worms may bear a prominent pathogenic part. Modern medicine has made us familiar with *anaphylaxis*. It may be shortly stated that this implies a poisoning by a proteid foreign to the animal exposed, but a dose of which has been taken a certain number of days before and has aroused an extreme sensitiveness to a second dose of the same agent. Such alien proteids introduced through the healthy stomach or other intact mucous membrane undergo a form of digestion that makes them safe and wholesome; to hypersensitize the system to a second dose, the proteid must have been injected unchanged into the tissue or circulation (lymphatic or hæmatic), and thus have escaped the protective action of the cells of the mucosa. Here, then, is where it seems possible for the worms to prove a baneful or deadly factor. In sucking the blood, each of the myriads of worms plunges its circle of buccal lancets through into the capillary vessels, and when it has finished its meal it leaves a row of many fine bleeding points. Multiply these many hundreds or thousands of times and we have ample entrance channels for the solution of dangerous proteid. Add to this the many holes through which the larval worms have penetrated the mucosa to find a home for their development in the submucous cysts, the serous cavities and the blood vessels. Not only does each larval worm make an entrance channel for the inimical proteid, but it may further carry the proteid with it on and above all in its body. The proteids may be from different sources, they may be from the fodder, from injurious plants mixed with the fodder, from cryptogams and ferments (bacterial and otherwise), parasites of the food, or of other vegetable or even animal origin.

Nothing can be more deadly than such proteids when enabled

to operate anaphylactically. The bland white of egg is one of the most potent. The proteids of hempseed, flaxseed, castor bean, Brazil nut, cocoanut, pea, vetch, wheat, barley and maize, respectively, each produce a most deadly hypersensitiveness to a second dose like itself.

It need not be added that this has not been proven to be the true explanation of either of the diseases dealt with above. But as we have been dealing with theories, which are confessedly as yet but speculations, it cannot be out of place to advance one speculation more, which may form the basis for future investigation. The new speculation has at least the merit of a sound scientific basis in a known truth. It has the additional recommendation that should it be borne out by observation and experiment, it would explain the delay of the outbreak until the incriminated proteids had reached the stage of growth and metabolism at which they could operate as deadly anaphylactics, and no less the sudden suppression of the malady when the same metabolic products had passed beyond the stage when they could operate with deadly effect. Just as the seeds of certain gramineæ in maturing reach a stage at which they cannot be safely fed, yet later become again perfectly wholesome, so the sensitizing poisons may be most deadly at a given stage, and become later comparatively harmless when that stage has been safely passed.

Once proven the application of this to the Collinsville cattle disease is obvious. The different symptoms and lesions may be explainable on the basis of distinct forms of proteids introduced. Then the entrance channels for these may be formed by different blood-sucking or migrating worms—the hook-worm, uncinaria radiatus, strongylus radiatus or filicollis, cooperia curticei, pectinata, punctuata and onchophora, the whip-worm, cattle filaria, cysticercus bovis and tennicollis, esophagostoma, and, though outside the worm family, the embryo gad-fly and the bilharzia. Apart from the worms, infection atria may be found in tubercolous ulcers of the mucosa, vomicæ, invasion by acid-fast bacilli or by coccidia with attendant abrasions, and all kinds of wounds by sharp-pointed bodies in the food. The mind should be open to the great variety of dangerous proteids, and no less to the fact that in case of recovery from an anaphylactic shock an immunization has been established against that particular proteid by the formation of its anti-bodies.

JAMES LAW, Ithaca, N. Y.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

KANSAS CITY, Mo., January 14, 1913.

Editor of the AMERICAN VETERINARY REVIEW, *New York:*

In an open letter in the January, 1913, number of the AMERICAN VETERINARY REVIEW, page 464, over the signature of one R. A. Archibald, and reinforced with the apparent authority and responsibility of a very important office, namely, "Chairman Committee on American Veterinary Medical Association Affairs," the readers of the REVIEW are invited to join with the author of the letter in a discusssion of the affairs of the A. V. M. A., using the pages of the REVIEW as a forum. To those who have little or no knowledge of the association's affairs, the numerous affirmations and innuendoes contained in the letter will naturally be construed to mean that the A. V. M. A. is not devoting its efforts to the purposes set forth in the portion of the constitution quoted, and that the author of the letter is such a loyal and faithful member that he will not listen to proposals of secession (it is regrettable that the names of the proposers of secession were omitted from the letter), but has set himself to the task of leading the association out of the clutches of a designing few (not more than four) who have been using this organization for selfish purposes. This organization of over 1,500 hundred veterinarians is composed of sturdy practitioners, state board examiners, state veterinarians, federal officers, executive heads of departments of public service, college professors, editors, etc. Oh! The monstrous four! The predatory coterie! The despicable and mendacious grafters! The call is for volunteers to help unhorse this mighty few.

Those who are really acquainted with the affairs of the American Veterinary Medical Association are astonished at the rapidity of its growth in members, and are proud of its achievements along the various lines of its several activities. Only the chairman of the aforesaid committee is blind to the splendid and general goodfellowship manifest at every annual meeting. Brotherhood and true fraternity permeates and dominates all the association's doings. The members from British Columbia, Manitoba, or Quebec are as cordially greeted and as heartily applauded as the member from California, New York or Illinois. The association certainly exemplifies international goodfellowship. The fulfilment of the other announced purposes of the association are as patent to the unbiased observer as the one just discussed.

True, the ideals have not been reached and we trust will ever lead the membership to greater achievements, and if the aforesaid Chairman and one or two others, well known to the membership, will put aside their active political aspirations and devote their energies to the promotion of Article II. of the Constitution quoted in this aforesaid letter, their good works will be duly rewarded. When they learn that office in scientific bodies should seek the man, rather than the man seek the office, they will get themselves into harmony with true fraternalism, true fellowship among members of the profession.

If the young blood alluded to in the CHAIRMAN'S article is made up of those who are applicants for membership, that they may become "self-respecting aspirants for political honors," regardless of their compliance with the accepted code of professional ethics, there can be no doubt that the Association will better fulfil the purpose for which it was created without their inclusion in the membership.

The plaint of the CHAIRMAN is born of failure to control Association affairs by political tactics, undertaken in utter disregard of the distracting and blighting effects experienced by the Association through such tactics heretofore, and which methods the Association put aside in 1905, by adopting the present methods of nomination to fill offices. The Association will put the present method aside as soon as a still better method is found.

The harsh and uncomplimentary language used in this letter concerning the presiding officer was made without taking into account his, the CHAIRMAN'S, somewhat recent violations of the Association's code of ethics and consequent blasting of his immediate opportunity for high office. The old saying about glass houses and throwing stones is applicable. Let the good brother get right and keep right, and we will jointly help make the A. V. M. A. grow more rapidly toward the ideal.

(Signed) H. JENSEN.

THE INSULAR VETERINARY SERVICE.

BLACKSBURG, VA., January 6, 1913.

To the Editor of the AMERICAN VETERINARY REVIEW:

I was much interested in the criticisms by Dr. Ward in the December REVIEW of the report that I made as chairman of the Committee on Insular Veterinary Service to the A. V. M. A. annual meeting in 1911, and his glowing account of the splendid

opportunities, financial and otherwise, that the Bureau of Insular Affairs now offers to veterinarians in the Philippines. I regret that the published report of the A. V. M. A. for 1911 omitted my verbal remarks made preliminary to the report I presented, as I stated that the report presented was mine alone, and I only was responsible.

My friend Dr. Ward is correct when he assumes that the report was made at "the eleventh hour and without all available information." I had waited a year for the valuable information that Dr. Ward possessed, and not receiving anything from him until it was too late to get a letter to the Philippines and a reply, I made the report referred to, a report that I still maintain was substantially correct at that time.

In the summer of 1909 on my return from five years' service in Cuba, I went to Washington at the request of the Bureau of Insular Affairs to consider with them the acceptance of the position which Dr. Ward now so ably fills. I declined to consider the place for two of the reasons given in my report, insufficient pay and unsatisfactory political conditions that existed among the American civil officials in the Philippines. I got my information from the published reports and from the members of the Bureau of Insular Affairs and other civil employees who had seen service in the Philippines and in whose conservative judgment I had confidence. Later when I was visited by one of the high civil officers of the Philippines he fully confirmed the absolutely unbiased opinion that I had previously formed. I rejoice with Dr. Ward that this serious hindrance to veterinary progress there has been eliminated, although one of the officials who was said to be a stumbling block is still in the service there. Dr. Ward has undoubtedly converted him from the error of his ways.

The question of adequate remuneration is one of opinion, and, taking the figures given by Dr. Ward, I still hold that for foreign tropical service the pay is not adequate. At the time I mention it was very difficult to get veterinarians even without special qualifications for that service to enter. They are undoubtedly swamped with able men now. As to promotion, Dr. Ward states that there are 28 positions with five vacancies in two years. Surely the vacancies did not occur from death in such a health resort as the doctor pictures the Philippines, so we must assume that they retired to live on the wealth they had saved from the salaries he mentions.

It was unfortunate that I used the quotation "grim destroyer fever." It was one of the unfortunate errors that my awkward

pen is frequently committing. I assumed that it would be understood as a figure of speech. There is one statement in Dr. Ward's criticism of my report that is correct and to which I agree and that is that my report was "altruistic." There was not the slightest idea of personal gain in making the report. It was made solely in the hopes that it might be of benefit to others.

The report that Dr. Ward attempts to criticise was really a plea for a properly organized army veterinary service. As our insular possessions, Porto Rico, Canal Zone, Hawaii and the Philippines, are administered by a bureau of the War Department, I believe that the veterinary work could be better and more logically administered by a properly organized army veterinary department than it now is in the haphazard way. I cannot say plan, for there is none at present in force.

I am fond of the tropics and have visited many different countries and lived in the tropics longer than has Dr. Ward, and probably under as favorable living conditions. I know how expensive life is there and how great is the isolation. The risk from febrile and intestinal diseases is greater there than in the temperate zone in spite of Dr. Ward's statistics, and there is no retired pay in case of disability. I hope that nothing I have written will be interpreted as reflecting in any way on the excellent work that I believe my friend Dr. Ward is doing in the Philippines. We need many such men in our insular service and I hope that the ideal conditions pictured by Dr. Ward will attract many to this service that in the past has been begging for qualified men. With such conditions as now appear to exist we shall expect splendid results from the Philippines.

N. S. Mayo.

Cottonwood, Minn., January 6, 1913.

Editor, American Veterinary Review, *New York:*

This comes from a constant and careful reader of the Review. A magazine such as yours, that brings to us the cure and treatment of ailments from European and American scientists and veterinarians, is certainly a great help to the practitioner, whether he be engaged in the business for a long or a short time. For we never are too old to learn and a beginner may be initiated with great advantage, especially so when the information comes from a reliable source. A back-number veterinarian will never dare to make a statement or a suggestion.

Now I have in mind to have a short chat with Dr. Horace Bradley. I agree with him that we are taught many ways to cure a disease or an ailment in a text-book, but when carried from the dead leaf into practice, that treatment sometimes fails. Do we not have Dr. S. H. Ward's statement in January issue that "there are points met with in our autopsies which differ materially from those given by these authors (Hutyra and Marek)? Further on under "Autopsy," on page 440, Dr. Ward says, "the condition of the spleen in *cases* (not one) coming under our notice is at marked variance with the findings of Hutyra and Marek, who state 'the spleen preserves a normal appearance.'"

Of course there is no thought to dispute the reliable writings of these authors. But the way I always figure it in my mind in all cases, whether veterinary medicine or otherwise, is "have the other fellow's advice as a *passive* and use your own judgment as an *active* means." In other words, to use the common parlance, "use your horse common sense."

After all this preface my chat with the doctor commences.

Dr. Bradley, I like your way of treating choke in animals. I like it just because it requires not much work and is very simple. I had an opportunity in the June issue of this paper to write of treating azoturia with KNO_3. This KNO_3 treatment applies also for laminitis. I have used this treatment frequently and it has seldom failed.

Now for choking. Apomorphine has been used with great advantage, and subcutaneously, as it is more quickly absorbed that way. Its action is expectorant and sedative, and produces relaxation and increase of secretion.

If I understand the doctor right, in a case of choking all we need is relaxation and increase of secretion. Won't hot, *very* hot compresses of H_2O on the oesophagus render the same service? I do not mean to discard the apomorphine treatment, as in all probability the next time I am called to a case of choke I may use it. But I have used more than once the hot water treatment, and a gentle downward manipulation with the fingers on the gullet, and never failed. If Dr. Bradley labels his treatment No. I. I shall label mine No. II. A few cases in which No. II. treatment was used with great advantage:

Case 1.—A bay mare, a family horse and a pet to the children, swallowed a corn cob that was lodged in the middle of the cervical portion of the oesophagus. The mare would shake her head in all directions in a spasmodic way, some glairy liquid ran from the nostrils, the cervical muscles would contract so as to

clearly show the direction of the fibres. The jugular furrow was obliterated. The fluid would occasionally flow down and I was summoned in a great hurry. Being desirous of locating the cob, I requested the owner to hold the halter and I laid my right arm around the neck and with my left hand got hold of both nostrils and interfered with respiration for about half a minute. Did this three or four times. Water by that time was gotten and the mare was greatly relieved after ten minutes' application, and the children were singing "Hosanna" when they saw their dear pet drinking water and eating.

Case 2.—A gelding choked. Hot water and extension of neck as much as possible, so as to enable one to push down the foreign body, brought prompt relief.

These two cases are a few months old. The horses are doing their daily duties as if never anything had happened to them, but I treated a case about two weeks ago and I do not know the outcome as yet, as the farmer lives many miles from me and has no 'phone. I was afraid some oats had entered the trachea in that case.

Respectfully,

S. J. Alcalay, D.V.M.

Michigan Veterinarian Banqueted by His Colleagues. —Dr. Cummings, of Port Huron, Mich., was tendered a banquet by his professional friends in Michigan at the Hotel Richter, in Detroit, on January 7. He was induced to go to Detroit on a pretext by his friends and was thoroughly surprised and delighted. He was presented with a beautiful leather chair as a testimonial of the esteem in which he is held by members of the state association. Dr. Brodie, of Pontiac, presided, and impromptu toasts were responded to by nearly every man present. Dr. Cummings has practised veterinary medicine in Michigan since 1870. The following were present at the banquet: Drs. Brenton, Hawkins, Joy, Veldheuis, Krey and Morrison of Detroit; Drs. Dunphy and Wilson of Rochester, Mich.; Dr. Wilkinson, of Holly; Dr. Brodie, of Pontiac; Dr. Gibson, of Adrian; Dr. Baldock, of Birmingham; Dr. Cavell, of Northville; Dr. J. B. Stevens, of Yale; Dr. M. J. Smead, of Port Huron; Dr. Black, of Richmond.

OBITUARY.

WILLIAM DOUGHERTY, V.S., D.V.S.

Dr. William Dougherty died suddenly at his home in Baltimore, Md., on the morning of January 2, 1913, in the 69 year of his age, having been sick but five days. The cause of death was fatty degeneration of the heart. Dr. Dougherty was born in Gortin, Tyrone County, Ireland, in 1844, and came to America when quite young, and entered the U. S. Army as Director of Transportation in the Quartermaster's Department, located in New Orleans. On leaving the service he went to Lakewood, N. J., where he was successfully engaged in the stable business until 1870, and afterward trained race horses until he finally entered the New York College of Veterinary Surgeons, from which he graduated in 1874, receiving the degree of V.S., and two years later graduated from the American Veterinary College, receiving the degree of D.V.S., at which time, 1876, he went to Baltimore and began practice, continuing the same up to a few years before his death, when he retired. During his years of retirement he traveled considerably; had made several trips to Europe, always spending some pleasant days in Paris with his tutor and life-time friend Professor Liautard. Dr. Dougherty was one of the loyal veterinarians that always put his profession first, and by his life and business methods did much to uplift it. Being an old and faithful member of the A. V. M. A., he was well known to veterinarians everywhere. He was a charter member of the Maryland Veterinary Medical Association, and during his membership occupied the several offices in the organization. Dr. Dougherty was a widower at the time of his death, having lost his wife (who was before her marriage Miss Matilda Sproul, of Philadelphia) in 1899. The doctor is survived by a nephew and niece, who reside in Massachusetts. His genial presence will be missed by his host of friends at the A. V. M. A. meetings, as well as by his fellow veterinarians in Maryland. At a meeting of the Maryland Veterinary Medical Association on January 14 a committee was appointed to draft resolutions of regret on the death of Dr. Dougherty. Some of his close friends in the profession acted as pall bearers at his funeral. Among whom were Drs. H. A. Meisner, Joseph P. Grogan, Frederick L.

Filber, C. L. Mackie, H. F. Mackie, Daniel R. Hoffman, Joseph M. Heagerty and Horace A. Hedrick.

FIELDEN LETT, JR., M.D.C.

Dr. Fielden Lett, Jr., died at his home in Seymour, Indiana, from the result of an injury to the spine received more than four years ago in falling from a hay-mow; which, despite the best medical care, rendered him powerless below the waist at the time, and he remained so up to the time of his death. Dr. Lett was married to Miss Pearl Hudson, in 1900, while a student at the Chicago Veterinary College. On graduating from that institution, in 1902, he began the practice of his profession at Seymour, Indiana, and enjoyed a lucrative practice up to the time of his injury in August, 1908; the four long years since which time, until he was called to his Maker, have found his faithful wife always at his side, never faltering in her unfailing love and care for him. His jolly disposition that made him many friends in his college days remained with him during the long period of helplessness, and a smile and a handshake was ever ready for a calling friend. Up to the time of his injury he was an active member of the Indiana Veterinary Medical Association, and was a faithful attendant at its meetings. He is survived by his parents and two sisters, as well as the widow, to whom the sympathy of the veterinarians of Indiana and his class-mates of the Chicago Veterinary College, 1902, are extended.

Business House Celebrates Fiftieth Anniversary.—In the closing week of 1912 The Farbwerke-Hoechst Company celebrated the fiftieth anniversary of its establishment, and it is interesting to know that, from a small beginning, the concern has grown until, at the time of reaching the half century mark, it has twelve thousand people in its employ.

The names of the following veterinarians are included in the membership of The Society of American Bacteriologists: J. W. Connaway, Columbia, Mo.; C. F. Dawson, Jacksonville, Fla.; P. C. Fitch, Ithaca, N. Y.; Ward Giltner, East Lansing, Mich.; John R. Mohler, Washington, D. C.; V. A. Moore, Ithaca, N. Y.; R. C. Reed, Newark, Del.; John Reichel, Glenolden, Pa.; E. C. Schroeder, Washington, D. C.; W. J. Taylor, Bozeman, Mon.; Leunis Van Es (Agricultural College), N. Dak., and A. R. Ward, Manila, P. I.

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION, NEW YORK CITY, DECEMBER MEETING.

The regular monthly meeting of this association was called to order by the Vice-President, Dr. R. H. Kingston, the President, Dr. Berns, being absent on account of illness.

The minutes of the October and November meetings were read and approved, also the minutes of the special meeting of November 18, 1912.

Dr. McLaughlin, chairman of the committee appointed to investigate the case of Mr. Benj. H. Mount, who was supposed to be infected with glanders, reported as follows:

Mr. Mount had his second finger of his right hand affected, said to be due to a cut received while dressing an abscess on a horse which was shortly afterward destroyed as a positive case of glanders.

This finger when seen by the committee was considerably swollen, the skin being white in appearance, thick and two slight openings, one at each end, from which pus issued very slightly. From one of the openings Dr. Schlesinger took two specimens to grow cultures.

About three inches above the wrist on the inside of the arm there was a pustule. This pustule was healing. Around the pustule and running around the arm was a discoloration of the skin. This discoloration was not present, according to Mr. Mount, until after he had been treated at the hospital, and appeared to be the result of some irritant application.

A rash extended over the arm in the shape of a great many small, brownish red colored spots.

There was no swelling in the arm, although it was stated that there had been a great deal of swelling.

The shoulder was complained of as being sore, and it looked somewhat larger than the other, but the soreness was explained to be due to the driving of an automobile, his sore finger causing the exercise of unused muscles in the shoulders.

The axillary gland was normal, but Mr. Mount said it had been swollen.

The left hand had a sore, which was thought to be due to some local irritation. This was on the index finger. On the wrist there was a pustule which was slightly moist but healing.

Mr. Mount said that the finger had caused him great pain, but now the pain was comparatively slight.

He assured the committee that he felt fine, and he appeared to be in perfect health. He also stated that he had been very much frightened, but now he had no fear.

The committee concluded that the patient did not exhibit any positive symptoms of glanders.

This report was on motion received.

Mr. Mount was then presented by Dr. C. L. Antony (M.D.), who had the dressings removed from the finger and the patient stripped to the waist.. Dr. Antony stated that the lesions on the right hand have the appearance of a burn, but are not in a healing condition. Guinea pigs, inoculated, have developed no signs of glanders. Smears show nothing; no fever.

Dr. Schlesinger stated that guinea pigs, inoculated 3½ weeks ago, gave negative reactions.

Dr. Blair asked if blood specimens had been taken for the sera tests. Dr. Antony stated that up to the present time this had not been done.

The patient was examined by the members and visitors present with a great deal of interest.

Dr. Killilea (M.D.) examined this case and stated that he would recommend the use of mallein, and suggested that it would be an excellent thing if the patient could be placed in the Rockefeller Institute.

Dr. Moffitt Smith cited a case of human glanders, which was discharged from one of the local hospitals as cured, but in a short time suffered a relapse, was returned to the hospital and died.

Dr. H. D. Gill gave an interesting account of a case of glanders in a horse in which the temperature and respiration were abnormal. Reacted to the blood and mallein tests. Temperature reduced to 101° F.; discharge from nostril stopped. Week elapsed, and two typical farcy buds developed on the hock.

On post mortem extensive lesions were found. The doctor stated that invariably when glander lesions are found externally they will also be found internally.

Also cited another case in which post mortem was held, and

the condition of the lesions found indicated that healing was taking place and recovery would have probably resulted.

Dr. E. B. Ackerman also mentioned several interesting cases of glanders that he had come in contact with. Held post-mortem examinations on two cases that had external farcy lesions, but no visible internal lesions.

Dr. Ellis asked if a horse in which the glander lesions had healed was a safe animal to keep? It was the general opinion that such an animal would be safe.

Dr. McLaughlin cited a case of positive clinical glanders in a horse owned by a druggist which was cured and worked for years afterward.

The secretary mentioned three cases of glanders in human subjects which had come under his personal observation, all of which resulted fatally.

Dr. R. W. Gannett stated that six years ago he was supposed to be infected with glanders, but the sera tests proved negative, and symptoms and lesions cleared up.

Dr. Gill asked Dr. Killilea (M.D.) if in his opinion a human subject may be infected with glanders, and not show any positive symptoms, and if any symptoms are present if it is not possible that they may clear up.

Dr. Killilea said that without doubt local lesions may occur and clear up.

A general discussion of this subject then took place.

A unanimous vote of thanks was tendered Drs. Antony and Killilea.

A list of veterinarians which Chief Veterinarian J. G. Wills, of the Department of Agriculture, requested corrected was then read by the secretary and changes of addresses noted, also those known to be deceased.

Dr. R. W. Ellis, chairman of the committee on glanders resolutions, read the resolutions adopted by this association, and submitted to the Commissioner of Agriculture for his consideration.

This report was accepted and a vote of thanks extended to the committee.

This being the annual meeting, the reports of the officers and committees were then called for.

Dr. McKinney, chairman of the prosecuting committee, gave a brief account of the work done by this committee, and stated that he would render a detailed report of the finances at the next meeting.

The Secretary and Treasurer's report was on motion duly accepted.

The next order of business being the election of officers for the ensuing year, resulted as follows:

President, W. J. McKinney; Vice-President, R. H. Kingston; Secretary and Treasurer, R. S. MacKellar.

Dr. McKinney in his usual inimitable way thanked the association for the honor conferred in electing him President, and asked for the co-operation of every member during the coming year to make it a successful one.

No further business appearing, the meeting adjourned.

R. S. MacKellar, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY, JANUARY MEETING.

The regular monthly meeting of this association was called to order by President-elect McKinney, January 8, 1913, at 8.45 p. m.

The minutes of the December meeting were read and approved.

Dr. McKinney, chairman of the prosecuting committee for 1912, reported a balance of $243.95 in the prosecuting fund.

The president then made a few pleasing and appropriate remarks eulogizing the veterinary profession; also strongly advocated the use of anæsthetics in both major and minor operations.

The following appointments were then announced:

Board of Censors—Dr. D. W. Cochran, chairman; Dr. C. E. Clayton, Dr. J. E Crawford, Dr. H. D. Gill and Dr. W. Reid Blair.

Judiciary Committee—Dr. R. H. Kingston, chairman; Dr. D. J. Mangan and Dr. P. Burns.

Prosecuting Committee—Dr. Charles Jamieson, chairman; Dr. Moffitt Smith and Dr. L. Griessman.

Dr. John A. McLaughlin, of New York City, then read a paper entitled "Outlines of a New Physiology." This paper was productive of quite an animated discussion, in which some of the members expressed themselves as directly opposed to the theories advanced by the essayist.

On motion regularly made, seconded and carried, the discussion of this paper was discontinued.

Dr. R. W. Gannett, of Brooklyn, N. Y., then read an interesting paper on "Fistulous Withers and Poll Evil." The doctor cited several cases where extensive operations had given very good results after other treatments had failed.

Dr. Ryder, in discussing this subject, mentioned a black mare which had a cicatrix of at least three years' standing on one side of the neck. A fluctuating fistulous swelling appeared on the other side, which was opened freely, and auto-therapy treatment used with good results.

Dr. Mangan stated that he has had remarkably good results with auto-therapy in the initial stages of these conditions, and considers it almost specific where no necrosed bone or dead tissue act as a foreign body, necessitating surgical interference.

Dr. Cochran mentioned having a case in which he trephined the scapula to drain a pus-pocket which had formed behind that bone.

Dr. Chase gave the history of two cases which he had treated by auto-therapy, resulting in a cure in about three months.

Dr. Mangan also stated that the interest in auto-therapy was wide spread, as he had received inquiries regarding the same from as far away as Australia.

Dr. P. K. Nichols stated that he was making some experiments along this line in the treatment of hog cholera, but had not progressed far enough to make any definite statement as to its efficiency as yet, but was inclined to believe that some benefit had been derived from its use.

Dr. C. C. Cattanach, owing to having permanently located on the Jersey coast, and being unable to attend the meetings, tendered his resignation, which was regretfully accepted.

It was regularly moved, seconded and carried that the discussion of Dr. McLaughlin's paper be continued at the next meeting.

It was also on motion unanimously decided to hold a "smoker" in the near future, and the following committee was appointed, with full power to make arrangements for the same: R. S. MacKellar, chairman; Moffitt Smith and C. G. Roher.

Dr. Moffitt Smith stated that it was reported that Benj. Mount had developed a positive case of glanders.

Dr. R. W. Ellis reported that he had received the good news from Dr. Hoskins that the Army Bill had passed the House, and urged that every veterinarian exert himself to the utmost to have the Senate take similar action. Dr. Ellis asked President McKinney, who was to leave on the midnight train for Ithaca for

the State conference, to bring the Army Bill before the veterinarians of the State and get them into action.

On motion, which was unanimously carried, the secretary was instructed to write Senators Root and O'Gorman in the name of this association, urging them to support this measure.

Several members promised to contribute to the program of the February meeting.

There were over forty members and visitors present.

Meeting adjourned.

R. S. MacKellar, Secretary.

RESOLUTIONS ADOPTED BY THE IOWA VETERINARY ASSOCIATION, IN SESSION AT AMES, NOVEMBER, 1912.

The following resolutions were unanimously adopted at the Twenty-fifth Annual Meeting of the Iowa Veterinary Association:

At this twenty-fifth anniversary annual meeting we congratulate ourselves on the phenomenal growth, influence and standing of this association, whose members past and present are now filling a large number of the most important positions in the veterinary world.

We greet with pride the charter members present, chief of whom is our President, Dr. E. E. Sayers, and we sincerely hope these charter members present to-day may continue to meet with us during the coming annual conventions until we meet twenty-five years hence to celebrate the golden anniversary of our beloved association.

At this meeting, held in the newly erected Veterinary building, we congratulate the veterinary faculty and students on the fact that they are now being cared for in the best built and finest equipped veterinary college in America, and we, the members of this association, pledge to the educational board of control and the veterinary faculty our heartiest support for the coming years in the securing of larger classes than heretofore known in this, our department, of the great Iowa State Agricultural College.

We compliment the ladies of the Department of Domestic Science on their display of floral decorations in the magnificent "Mound of Beauty" centerpiece, and the table decorations of the numerous varieties of Ames chrysanthemums, more beautiful than any ever imported from the "land of the setting sun," and

we tender to these ladies our sincerest thanks for the best banquet menu ever prepared and served for this association at its annual convention, and recognizing the important place the Department of Domestic Science occupies in this great industrial school in the training of our girls in the art of housekeeping and home-making, we unanimously oppose the removal of this department from Ames, and most earnestly request of the State Educational Board that they reconsider and rescind their recommendation suggesting its removal to Iowa City.

To the members of the Des Moines Male Quartet we tender our thanks for their well-rendered selections, which added much to the enjoyment of the evening after the banquet.

To the associated faculties of the Iowa State College and the business men of the city of Ames, we tender our most hearty thanks for the magnificent welcome accorded this association and the splendid banquet given by them, and to the fraternities and the people of Ames for their hospitality and splendid entertainment of our members during their sojourn here.

To the ladies of the faculty we are deeply grateful for the beautiful manner in which they entertained our wives at luncheon and during our stay in the city, which more than anything else insures our return to Ames for future conventions.

We congratulate the veterinary faculty and students on their success in securing the material and conducting one of the best and most instructive clinics ever held during an annual convention.

(Signed.)

Dr. J. I. Gibson,
Dr. S. H. Bauman,
Dr. L. U. Shipley,
Committee on Resolutions.

FURTHER RESOLUTIONS ADOPTED BY THE IOWA VETERINARY ASSOCIATION.

Whereas, The livestock interests of Iowa are subject to great losses because of infective diseases; and,

Whereas, The losses from these diseases may be restrained, prevented and the diseases even eradicated by the intelligent use of biologic laboratory products, such as vaccine, bacterins, serums and antitoxins; and,

Whereas, Such biologic products are manufactured or produced and sold to the people of Iowa by individuals, companies and corporations located in all parts of the United States and in other countries; and,

Whereas, These biologic products have not proven uniformly dependable and ofttime have served to spread disease through ignorance, negligence, or mercenary unscrupulousness of some producers; therefore, be it

Resolved, That we, the members of the Iowa Veterinary Association, urge upon Congress the necessity of making provision for federal inspection of all plants engaged in the manufacture of Veterinary biologic products offering such products for interstate trade, and forbidding such trade excepting where the product shall equal a standard of quality to be established by the government, and that the standardization, inspection and licensing shall be made the duty of the Bureau of Animal Industry, Department of Agriculture; and be it further

Resolved, That we request the United States senators and members of the United States House of Representatives from Iowa to give the matter particular attention in behalf of the livestock interests of Iowa.

C. H. STANGE, Secretary.

INDIANA VETERINARY MEDICAL ASSOCIATION.

The seventeenth annual meeting of the association convened at ten o'clock, January 15, at The Denison Hotel, Indianapolis. The following officers were elected for the year 1913: President, J. G. Heighway, of Ladoga; vice-president, W. B. Carter, of Covington; secretary, A. F. Nelson, of Lebanon, and treasurer, J. W. Klotz, of Noblesville.

Resolutions were passed opposing an internal revenue tax on veterinarians for the dispensing of cocaine, opium and its alkaloids, etc., and also the recording of each case in which they are used, as proposed in a bill now before the House of Representatives of the present session of Congress, the resolutions setting forth that, so far as we know, no graduate veterinarians are engaged in the practice of dispensing habit forming drugs, and that to keep a record of each case would work an unnecessary hardship on the busy practitioner, especially those that are humanely inclined, and use local anæsthesia for minor operations. The following papers were read and discussed: "Pyæmic

Arthritis," by Dr. T. A. Sigler. Dr. Sigler's paper, though an excellent one, failed to elicit much discussion, probably from the fact that the next paper was on the same subject. "Pyo-Septicæmia of Sucklings," J. C. McDaniel. This was another good paper and was fairly well discussed; each of these papers covered the ground so well that there was not much left to discuss. "Horse Doctoring As It Was," C. I. Fleming. This being a subject so much different from those generally discussed, and the author in his reminiscences picturing the past so vivid to us, left no opening for a discussion. "Report on Vaccination of the Hog," J. H. Mills. This was to be a case report but as the doctor, after looking over the record of herds vaccinated, found that he had vaccinated 219 herds, it was impossible for him to get his report ready for the meeting. As is usual, vaccination was thoroughly discussed, and from the discussion the usual good, bad and sometimes unlooked-for results were reported. "Autogenous Vaccines," Geo. H. Roberts. The author described in full his methods of making and administering the various autogenous products. There was a liberal discussion and question asking on this paper, bringing into prominence one of the most potent factors in treating bacterial infection, and no doubt arousing in the minds of most of those present the sound logic of autotherapy. "Parturient Paresis," H. A. Miller. Another excellent paper, well handled by the author, and incidentally bringing out many theories as to the etiology of the disease.

On Thursday, January 16, at 9 a. m., the association met at the Indiana Veterinary College for clinics, Dr. J. W. Klotz in charge. There were various interesting operations, among them being the removal of a tumor of the mammary gland of a mare, this tumor weighing about twenty pounds and being the third one removed; the two previous, were removed at periods of six and three months intervals. Operators, A. B. Carte and R. C. Applegate. "Demonstration of Vaccination of the Hog." J. H. Mills did the injecting of the animals, assisted by various others. "Operation on Perineum of Mare." This operation was done by Dr. J. W. Klotz and others, the doctor demonstrating to those present his method fully for this operation. "Poll Evil Operation," consisting of the resection of the ligamentum nuchea; operators, Drs. Geo. H. Roberts and W. J. Armour. There were various other operations; in fact, the clinics lasted all day, giving those late in arriving plenty to entertain them.

A meeting was called at 1.30 p. m. in the senior class room for the purpose of receiving the report of the outstanding com-

mittees, and at this session four new members were submitted, making in all a total of 26 new members at this meeting, which is not so bad when you consider that we had the A. V. M. A. meeting this year, and as the "boys" were all in attendance at it we would naturally suppose it took some of their reserve fund.

The Necrology Committee reported the deaths of E. H. Pritchard and Fielden Lett, Jr., and resolutions of condolence to the families of each were adopted.

A Legislative Committee of nine members (one from each Congress District) was appointed to look after proposed legislation, both state and national, detrimental to the veterinary profession.

Notwithstanding the inclement weather, the seventeenth annual meeting was a decided success, and demonstrates that the veterinarians of Indiana are alive, and anxious to co-operate with each other in any manner that may lead to the advancement of the profession.

A. F. Nelson, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of the above association was held on the evening of January the fourteenth in Donaldson's Hall, Philadelphia, with President Yunker in the chair.

The essayist for the evening was Dr. M. Dorset, of Washington, D. C., the topic presented was the "Differentiation of Hog Cholera and Swine Plague," which was delivered in a most interesting way and deeply appreciated by every one present. Dr. Dorset said that in most all of the outbreaks described as as a pulmonary affection among hogs they invariably were proven to be hog cholera. Also that he believed that this disease can be safely controlled by the use of the serum and virus, and that its dispensation should be under the control of the state government. That in order to get the best results hogs should be inoculated in the early stage of the disease.

It was the consensus of opinion that the serum was of little value in animals whose temperatures were above 104 at the time of inoculation. Dr. Reichel thought that when it got that high that it was due to the secondary invaders. Dr. C. J. Marshall reported that they were getting very good results throughout the state with the use of the serum.

Dr. W. H. Hoskins reported the passage of the Army Bill through the House and urged the members to get after their Senators as there would be a hearing before the Senate Military Committee soon.

Several members reported favorably on the use of Equina-Lintz, both as a curative and prophylactically.

Dr. C. J. Marshall offered a motion seconded by Dr. W. L. Rhoads to send night letters to Senators Penrose and DuPont from the association telling them that the association urged their support in the passage of the Army Bill.

CHESTER M. HOSKINS,
Secretary.

NATIONAL COUNCIL ALPHA PSI FRATERNITY.

The third biennial convention of the Alpha Psi Fraternity was held at Philadelphia, November 29 and 30, 1912. The visiting delegates and national officers were the guests of the Epsilon Chapter of the University of Pennsylvania. The national officers in attendance were: Dr. H. E. Kingman, President, of Fort Collins, Col.; Dr. A. M. Jansen, Treasurer, of Columbus, Ohio, and Dr. H. Preston Hoskins, Secretary, of St. Paul, Minn. Alpha Chapter was represented by Mr. J. C. Schoenlaub, of Marion, Ohio; Beta, by Mr. A. Cameron Goff, of Caniesteo, N. Y.; Gamma, by Mr. R. S. Gerard, of Chicago, Ill.; Delta, by Mr. George W. Brower, of Cheyenne, Wyo.; Epsilon, by Mr. John T. E. Dinwoodie, of Bottineau, N. D., and Theta, by Mr. J. Isaac Handley, of Linesville, Ala.

The business meetings occupied the greater part of both days. Those who arrived on the 28th were taken to the Cornell-Pennsylvania football game in the afternoon. On the evening of the 29th the visitors were given a theatre party at the Garrick Theatre, and the usual banquet was held at the Majestic Hotel on the evening of the 30th.

The election of national officers resulted as follows: President, Dr. H. E. Kingman, of Fort Collins, Col.; Vice-President, Dr. E. S. D. Merchant, of Glen Cove, N. Y.; Secretary, Dr. H. Preston Hoskins, of St. Paul, Minn.; Treasurer, Dr. G. L. Drury, of Cherry Valley, Mass.

The next convention will be held in 1914 at Cornell.

H. PRESTON HOSKINS, Secretary.

SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE.

The above society has held its semi-monthly meetings during the semister. On November 8, 1912, Dr. D. H. Udall gave a very interesting talk on his visit to the continent. Dr. Udall visited all the larger veterinary colleges, among which were those at Berne, Munich, Vienna, Budapest, Hanover and Copenhagen; the larger part of his stay being with Dr. Hess at Berne.

On November 22, Dr. V. A. Moore spoke on the work of Pasteur. Dr. Moore, as usual, held the close attention of the student body.

The last meeting, held December 6, was addressed by Dr. C. E. Clayton, of New York City. Dr. Clayton gave a practical talk on "The Work of the Field Veterinarian." This talk filled a vacant place and was heartily enjoyed.

D. W. Clark,
Corresponding Secretary.

The Fifth Annual Conference for Veterinarians, held at the New York State College, Ithaca, N. Y., January 9 and 10, was the largest yet held. Prof. W. L. Williams' paper on "Diseases of the Internal Generative Organs in Relation to Dairy Inspection," was very instructive. The doctor showed his audience a specimen of a diseased uterus, from which pus had been discharging through the vagina, collecting and drying on the hindquarters and tail, scales from which were falling into the milk pail during milking. Dr. Phyfe's paper on "Dairy Inspection" was also very instructive, covering proper sanitation, concrete floors, etc. The doctor advised clipping the hindquarters of cattle and bedding them. The discussion which followed dealt fully with a clean milk supply. Following the address of welcome extended by Dean Hull, of the Department of Arts and Sciences, in the evening of the first day, Prof. B. Kingsbury, M.D., Ph.D., of the Department of Histology and Embryology, gave an illustrated lecture on "The Determination of Sex in the Offspring," explaining that this problem has been discussed for over two thousand years. The professor showed a series of embryology specimens. The rest of the evening was given over to relaxation in the form of a "smoker." The following day was filled with interesting papers, discussions and a clinic. Dr. Frank H. Miller gave a talk on anæsthesia as a factor in the

advancement of the veterinary profession, which was discussed by Drs. Williams and Law. Dr. Adams, of Philadelphia, gave a very interesting and instructive lecture on surgery. This was followed by an address by Dr. White, of Cornell University, who was in turn succeeded by Dr. Augustus S. Downing, First Assistant Commissioner of Education, who discussed the educational law as it now stands. At the clinic, Dr. Williams removed a thickened septum due to a fracture of the nasal bone, and operated on a case of osteomyelitis due to a diseased tooth. Dr. Frank H. Miller had a canine diagnostic clinic, and also did an oophorectomy on a collie bitch. In the evening of the second day the Society of Comparative Medicine of the New York State Veterinary College held a banquet, to which the veterinarians attending the conference were invited.

NOTE—We are indebted to Dr. David W. Cochran for notes from which this brief report was written.

SOCIETY OF AMERICAN BACTERIOLOGISTS MEET IN NEW YORK.—This society held its annual meeting in New York City, December 31, 1912; January 1 and 2, 1913. All-day sessions were held in the University and Bellevue Hospital Medical College, American Museum of Natural History and Rockefeller Institute for Medical Research.

The society aims to include in its membership any one who may appreciate the purpose of the society: "That, while the purpose of this society is primarily for the advancement of microbiology as a pure science, this must not be interpreted as excluding papers of applied microbiology which involve fundamental microbiological laws and technical principles, or which embody important discoveries.

The following veterinarians attended at least a part of the three day sessions: J. R. Mohler, Washington, D. C.; E. W. Mumma, Glenolden, Pa.; M. J. Harkins, Glenolden, Pa.; E. Records, Glenolden, Pa.; V. A. Moore, Ithaca, N. Y.; C. P. Fitch, Ithaca, N. Y.; R. C. Reed, Newark, Del.; Ward Giltner, East Lansing, Mich., and John Reichel, Glenolden, Pa.

"Studies on the Etiology of Hog Cholera," by Walter E. King and F. W. Baeslack, Detroit, Mich., and the paper read under the title of "The Production of Peptotoxins by the Bacillus of Contagious Abortion," by John Reichel and M. J. Harkins, Glenolden, Pa., were of considerable interest to veterinarians.

AMERICAN VETERINARY REVIEW.

MARCH, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, January 15, 1913.

CHOLESTEATOMAS.—The study of these tumors has been the subject of a paper presented at the Association for the Study of Cancer, of which I find in the *Presse Medicale* an interesting résumé. The paper was due to Dr. Roussy, who presented a very documented series of facts, expressed as follows:

A. *Actual Conception of Cholesteatomas.*—This name was given for the first time by Muller to encapsuled pluristratified malformations, containing concentric shining masses, rich in cholesterine.

Because of these concentric masses, Cruveillhier designated these tumors by the name of "pearled tumors."

They are observed on the level of the meninges, rarely in man, very commonly in horses—near the middle ear; in some glandular organs (mammae, testicles, ovaries, uterus); in the urinary apparatus (pelvis of the kidneys, bladder, urthra); near the skin, and finally in bones, particularly those of the cranium, whether the tumor presented or not colloid degeneration, calcareous infiltration or was or not the seat of hemorrhages.

The microscopic aspect varies. The only constant fact is the presence of cholesterine, which always gives the tumor a yellowish coloration, some hardness and has a shining aspect on its sections.

The nature of the histogenesis of cholesteatomas according to

the description of classical authors appears complex. Most of them agree in distinguishing them as:

1. *False cholesteatomas,* which include, on one side, those of the middle ear, of the nose, those of the urinary tracts; they are inflammatory tumors secondary to chronic suppurations, and remarkable by the accumulation of cholesterine in their thickness, but without any neoplastic character.

And, again, the cholesteatomas of the skin which are congenital malformations, much like epidermoid cysts from which they differ only by the rich presence of cholesterine in the degenerated epidermic products:

2. *The true cholesteatomas,* which have for type that of the meninges, and which form a peculiar class of neoplasms with special histogenesis.

Virchow, Billroth, Rindfleisch, French authors, consider these tumors as arachnoid endotheliomas, and Klebs goes so far as to say that cholesteatoma of meninges is the purest form of endothelioma.

On the contrary, Baratrom, Borsi and their followers consider the meningeal cholesteatomas nearly as those of the skin and make also of them congenital malformations comparable to epidermoid cysts.

* * *

Dr. Roussy then relates his personal investigations. Based on the complete histological study of more than twenty cases of cholesteatomas of meninges of horses, of one case in man and one in the mammae of a woman, these investigations have brought him to conclusions which simplify very much the difficult question of the pathogeny of those tumors.

The study of series of sections of meningeal cholesteatomas of horses shows that they are not neoplasms, but chronic inflammatory lesions of the choroid plexuses, and in some cases manifestly of tuberculosis.

The study of the cholesteatomy of a breast shows that it was a fibro-adenoma. That which, in all these cases, forms the pe-

culiarity of structure of these tumors, is the accumulation of cholesterine, whose crystals are easily studied to the polarimetrum with frozen sections and which, after dissolution, with sections closed in paraffine, which defines their geometric outside lines.

It is an error to divide cholesteatomas into true and false. They are all false in the meaning given them by classics, viz.: that the tumors described under that name have no peculiar histological origin. What groups cholesteatomas is not a common histogenesis but a common degeneration.

This same can be still applied to tumefactions which are some nodules of ordinary inflammation, others tuberculosis, some teratomas, others neoplasms. But it must be well understood that because these various tumefactions have a same name which indicates a same degeneration, they must not be considered as belonging to the same nosological group; no more than could be put in a same classification the fatty tuberculous liver and the hypernephrosis, because in the neoplastic kidney as in the degenerated liver there is fat, which in both cases gives the tissues a yellow coloration, soiling paper and taking an intense tint by some special reacting agents.

* * *

Lipoids.—Since the wonderful works in which Brown Sequard recommended in cases of weakness, debility and asthenia the injection of organs' extracts, a vast science has developed which is, so to speak, the inheritance of the ideas of that great scientist. Actually there are extracts of organs which are extensively used in therapeutics. The opotherapic indication has made its way in general practice. The mode of action of those extracts has been the object of careful investigations and it is known that they act as to take the place of organs whose functions have become insufficient. Their action is in general due to a substance which has some of the properties of fats and on that account have received the name of lipoids.

Among the many workers who have investigated and made a special study of lipoids Dr. Iscovesco is one, and at the last medical congress he presented the final results he had obtained with his researches and specially demonstrated that lipoids have for special action the stimulation of the functions of a given organ.

He has taken one of these lipoids, isolated from a special organ, injected it into rabbits for a certain length of time, and after two months observed that the organ from which the lipoid came had increased in size and in weight. In other words, each organ contains a lipoid which, thrown in the circulatory system, goes and surexcites the organ from which it has been taken.

Carried further, the observations of Dr. Iscovesco have shown that this tonic lipoid, homo-stimulating, has also a general action necessary to the organism. Women submitted to double ovariotomy are also relieved of all the troubles that they were otherwise having.

And again experiments have shown that the red corpuscles of the blood also contain a lipoid, which, injected into an animal which has been bled or has anemia, the lipoid stimulates the formation of red corpuscles.

From general conclusions, Dr. Iscovesco says in the *Presse Medicale* that there are a number of diseases whose morbid condition depends from the bad functions of one organ, and that by the discoveries which have been made of the lipoids, of their physiological functions and their therapeutic actions, with the proper application of opotherapy, the treatment of these diseases is now altogether indicated.

The pathology of small animals can derive advantages by borrowing from the literature on this subject in human medicine.

* * *

Inflammatory Tuberculosis.—Under that name is understood that tuberculosis which, deprived of all anatomical specificity, leaves lesions which are not characterized by the presence of visible tubercules, or even of the microscopic follicles, which

represent the initial stage of their formation and in which the tuberculous poisons determine far and in most varied organs ordinary inflammatory reactions, often attributed to some other cause.

This is an important question which interests the medical world and upon which an excellent book has just been written by Professors Poncet and Lebiche. The subject has a double importance; first, because no one can remain disinterested to any new doctrines relative to the pathogeny and unsuspected mischiefs of tuberculosis, but also because comparative pathology can enlighten by this present new conception of specific tuberculosis some of its yet remaining obscure problems. Indeed, says one of our best veterinary pathologists in reviewing the work on inflammatory tuberculosis, there might be great advantage to take hold again of the entire veterinary pathology to bring the subject up to the new conception.

In a recent article Professor Cadiot, in studying a certain number of osteo-arthropathy of tuberculous origin in the dog, has drawn the attention to the originality and the attraction of this new theory. Veterinarians would no doubt derive benefit by the reading of this new work, where they would find a complete exposure of the doctrine, where they will be shown how the entire organism can be injured by the tuberculous toxines that the circulatory system carries all over.

A peculiar fact, very persuasive by itself, is that experimentors and histologists having shown the possibility of the existence of lesions free from tubercles or of tuberculous follicles and yet being produced by the toxines or the bacilli themselves, can it not be admissible to consider as tuberculous many alterations which are observed during the life or after the death of a patient, carrier of occult tuberculous centers or even only suspicion of having them.

This is what Professors Poncet and Leriche have done in attributing a tuberculous origin to osteo-arthropathic lesions of horses, such as ankylosis, exostosis, spavins, etc. A theory which certainly can be refuted by many powerful objections. The ob-

servations of facts gathered from man, relating to possible inflammatory tuberculosis of the osseous and fibrous systems, of joints and tendinous synovial, may have an apparent or real resemblance to the lesions of the apparatus of locomotion of horses, but that is all. To go further is certainly an overstretched conclusion.

* * *

Arsenico-Mercurial Medication in Veterinary Therapeutics.—This has been the subject of a valuable work by a Mr. Boulin, veterinarian, and which has been the subject of a very interesting report presented at the Societe Centrale de Medecine Veterinaire in Paris. The author has made experiments, which proved most successful, against three serious diseases, the hemorrhagic septicaemia of sheep, the infectious typho-anemia of horses and the septicemic polyarthritis of new-born equines. The results that were obtained by the use of those mercurial and arsenical compounds and which are minutely analyzed and recorded are deserving of great attention, the statistics of the discoveries speaking for themselves.

The method resorted to by Mr. Boulin consists in intramuscular injections of benzoate of mercury and disodical methylarseniate in the following proportions: equal part of the benzoate, chemically pure, and of methylarsinate, 1 gramm, in 100 gramms of dissolving serum. One cubic centimeter of this solution contains 1 centigram of each salt. It is necessary to have the solution prepared in ampoules sterilized, at a temperature close to zero. As there will be a precipitate, the ampoule to redissolve the salts will be dipped for a few minutes in warm water. If the salts used are pure, the conservation will last indefinitely. The injections have to be made with all antiseptic precautions.

The lateral face of the neck is the place to make the injection in horses and cattle. The needle of an ordinary Pravaz syringe is thrust perpendicularly at about a depth of 3 centimeters and drawn away rapidly after the injection is made. So as to avoid the contact of the liquid with the connective tisue, the piston of

the syringe shall be raised a few millimeters to empty it thoroughly. Small colts will be operated on while down, sheep while standing. In this last animal the internal face of the thigh, near the posterior border, is the place for injection.

The doses have been carefully experimented. For large animals, horses and cattle, 40 cubic centimeters of the solution; in very severe attacks only the injection is repeated the next day; afterwards they are of 20 centimeters and renewed according to the severity and progress of the disease every three or four days. This last dose can also be used as a preventive. For poly-arthritic colt, even when only a few hours old, an injection of 20 c.c. has been used from the start. This same dose injected into the mother will grant immunity to the milk. In sheep affected with hemorrhagic septicaemia, the curative doses are of 10 cubic centimeters and the preventive of 5 repeated at even intervals, three times in fifteen days.

The stated results mentioned by Mr. Boulin are valuable evidences of the good results obtained by this treatment, which certainly justify trials.

* * *

New Cestoda of Sheep.—Under this heading Adjunct Professor Marotel has called the attention of the Societe des Sciences Veterinaires de Lyon to his mode of studying cestode and to a new parasite of sheep that he has discovered. The method is simple. Spread the worm on glass slide after its being colored in mass with borated carmine. In a few minutes and without any other preparation one can be documented upon the form, dimensions, structure of the helminth and *all of its* annexes.

Since a number of years Marotel has applied this method, principally with the cestodes of sheep. These worms, which belong to about ten species, are described in classical works by their character of external morphology, characters which vary considerably, according to whether the worm is dead, extended or contracted. For these reasons the dimensions varying, the classification may be contradictory and without positive determination,

and Marotel has decided to resort for base of a classification to characters more fixed and certain, the *anatomical* or *structural,* which are more rapidly exhibited and observed by his method than than the morphological.

In working up this new classification, which will be published when completed, Marotel has discovered a new species which he describes as follows: "The normal worm (without excessive extension or contraction, and completely developed) measures between 2 meters and 2 meters and a half in length, with 3 to 5 millimeters *maxima* width; it is then relatively short and specially narrow, hence the name of *minima* proposed for it. The head is followed by a long neck. A chain of two meters consists of about 1,850 rectangular rings, with their posterior angles, little developed. The interannular glands are enormous, three times larger than the testicles, in small number and arranged in transversal line, not occupying the entire intralacunar space. The *hermaphrodite zona* has approximately 400 rings, which are relatively elongated. The first ones are wider than long. The last ones are square.

"The genital pores are open slightly in front of the middle, in a notch situated on the summit of a round projection (not a sexual nipple). *The testicles not numerous* (150 about), form a rectangular surface which scarcely fills up the *posterior third* of the ring; sometimes this rectangular surface is very thin on the median line. Germigene and vitellogene well developed and apparent. Ovigerous rings from the 180th—200th centimeters, with genital pores on the anterior third."

These are the essential characters of this new cestodœ which has close characters to those of the *Maniczia expansa* and *trigonophora,* with which it may have been mistaken to this date.

* * *

BIBLIOGRAPHY.

Rabies.—I have received from the publishing house of J. B. Bailliere & fils a new work on *Rabies* by Prof. V. Babes, the emi-

nent director of the Institute of Pathology and Bacteriology of Bucarest.

There are probably few subjects of medicine which have a more abundant literature and yet in the presence of the valuable works and progress that has been realized and also of the present knowledge that is possessed, the publication of such *Treatise on Rabies* had become necessary.

Thanks to the existence of numerous antirabic institutes it is known to-day that rabies is much more prevailing and on a wider extent than was supposed years back. At the present time there are some hundreds of those institutions which among their work give out much information relating to rabies which is of very great value. And yet there is no specific work except the German work of Hoggis which gives all the facts now realized by science.

Babes has endeavored to produce one and has well succeeded. In the *Treatise on Rabies* he has given a large space to the experimental study of the disease, has treated in detail of the history of that fearful affection, one among the virulent diseases which is that whose history is most interesting, and considered the subject in all its various points of view.

We cannot give this good work the thorough review that it deserves. It could not do justice to its contents. The legislation, the sanitary medicine, the clinical history, the pathological anatomy * * * all are the object of most interesting consideration, without saying anything of the personal researches of the author and of the critics which he makes of the most recent investigations, and discoveries upon the etiology of rabies and the indicated changes in the preventive.

The work of Babes forms one volume of 677 pages with 11 illustrations. The contents are presented to the reader in 36 chapters—among which we will call specially the attention of veterinarians to Chapter V, treating of rabies from the point of view of general practice, the conduct indicated for a practitioner, physician or veterinarian, or a person that has been bitten; Chapter VIII, symptomatology of rabies in the principal biting animals, dogs, wolves, cats, horses, ruminants, pigs; Chapter XXXIV, the anti-

rabic treatment in animals: vaccination of dogs and vaccination of herbivora. Every chapter is very interesting, but those three, we believe, call principally the attention of the daily practitioner.

* * *

Bibliographic Acknowledgments.—*Archives des Sciences Biologiques* (Archives of Biological Sciences), published by the Imperial Institute of Experimental Medicine at St. Petersburg, Vol. XVII, No. 3.

Program of the 16th Annual Meeting of the United States Live Stock Sanitary Association. A special notice of which will be given as soon as the Proceedings are published.

The *Introduction and Spread of the Cattle Tick* and of the associated disease, tick fever, in Australia, by J. A. Gilruth, D.V.S., M.R.C.V.S.

Further Observations on Onchocerca Gibsoni, the cause of worm nodules in cattle, by J. A. Gilruth and Georgina Sweet, D.Sc.

The *Score-card* system of dairy inspection by George M. Whitaker, of the Bureau of Animal Industry.

The November number of the *Agricultural Journal* of the Union of South Africa, with an article on Afrikander Cattle, of good interest from the zootechnician point of view. The souvenir program of the 30th annual meeting of the Illinois State Veterinary Medical Association, which took place last December, and where Dr. J. H. Mohler, Dr. W. J. Martin, Dr. J. M. Wright, Dr. H. Crawford, Prof. Dalrymple, Dr. A. T. Peters, Prof. E. L. Quitman, Prof. White, Dr. Arthur Hughes, Dr. G. B. Jones, Prof. B. F. Kaupp presented papers of great interest. Program gives a list of the officers since the organization in 1883, and also that of its active members, some two hundred and fifty in number.

Bureau of Animal Industry, Bulletin 152: *Studies on the Biology of the Texas Fever Tick,* by H. W. Graybill, D.V.M., and W. M. Lewallen.

Bulletin 153: *The Action of Anthelmintics on Parasites Located Outside of the Alimentary Canal*, by Brayton Howard Ransom and Maurice C. Hall.

The *Lawrence Telegram*, from Dr. John F. Winchester.

A. L.

PRESENT STATUS OF ARMY VETERINARY BILL.

At this writing (February 24) the *Army Veterinary Bill* stands on the brink of success! And yet, the outcome cannot be predicted with any degree of certainty. Chairman Hoskins of the Legislative Committee, President Mohler of the A. V. M. A., and other members of the legislative committee have been strenuously at work in Washington during the past few days, with the result that they have secured a promise from the subcommittee on military affairs that they will bring the bill for action before the Senate Military Committee on February 27; and while the final battle of the campaign is being waged, the whole veterinary profession of America anxiously, yet confidently awaits the outcome. And should success crown their efforts, it will be the result of one of the fairest, hardest fought, non-partizan battles for a cause that has ever been waged in this or any other country. *Espérons-le.*

[Addendum February 28th.] Army Veterinary Bill Defeated—Campaign for Recognition in the 62d Congress Lost.—This last week has been devoted to a special appeal to the members of the Senate Military Committee and a summonsing to Washington of representatives of the profession from New Jersey, Virginia, Pennsylvania, and the filing of appeals from military officers in the states, urging this recognition; but all to no purpose. Nothing could move the chairman of the sub-committee, Senator Bristow, to a report. But that indefatigable worker, Chairman Hoskins, courageously announces that "we must now *begin anew* our battle with the 63d Congress, and every veterinarian must at once make the close acquaintance of his Congressman, and familiarize him with the justice of our cause, and early secure his co-operation in behalf of the same." The profession appreciates Dr. Hoskins' valiant services, and are a unit in supporting his renewed efforts for the cause.

ORIGINAL ARTICLES.

KNUCKLING AS A SYMPTOM OF SPAVIN.*

By James McDonough, D.V.S., Montclair, N. J.

I deem it a great honor to be allowed to address this body of veterinarians, for I am conscious of my inability to say anything upon any subject pertaining to veterinary science that can add to the knowledge of any man present. The only excuse I can offer in the form of an apology is my irresistible desire to place before you, for your consideration, a subject that has occupied my attention for the past ten years or more, the title of which is "Knuckling of the Hind-Limbs as a Symptom of Spavin."

Knuckling is a voluntary disarrangement of the bones at the ankle that can be reduced at will by the animal. Where we have present conditions that we know cause knuckling, it is very evident that the changes in the relation of the bones of the ankle are the result of the animal's effort to relieve the parts affected. As in a punctured wound of the foot, when the location of the wound is in the region of the heel, the ankle will immediately be thrown forward that the work may be lessened at the point of injury, so it is in the case of sprained tendons, or any other exciting cause found below the hock. But in all of these cases, where the cause is evident, the location can easily be determined by the presence of heat, soreness or swelling, and when the soreness has been relieved the knuckling will disappear.

This applies to a very small percentage of knuckled animals, for in most cases the cause is obscure, and there is not the slightest evidence of heat, pain or swelling, nor is lameness present

* Presented to the American Veterinary Medical Association, at Indianapolis, August, 1912.

oftentimes for years after a horse goes knuckled, and sometimes never.

It will oftentimes show itself first in one limb and then the other, or it may be confined to one limb, or may appear in both at nearly the same time, as often seen in young horses, say at the age of from two to five years. In these cases its development is very gradual; the first symptom detected is a very slight displacement of the ankle, when the foot first comes in contact with the ground, to disappear when the limb takes weight. This will be followed by an interrupted condition of knuckling while at rest, when the animal will be seen to stand knuckled for a minute or longer at intervals.

This condition is apt to progress, and the animal may begin to stumble or "break over" behind. He may or may not show lameness, but at this time I challenge the skill of any person to detect the presence of a condition that can in any imaginary way be responsible for these changes, but here are effects, and a cause must be present, and our inability to find it must not be accepted by us as proof that it does not exist.

I will here quote the remarks of Prof. Liautard as they appear in the book on the disease of the horse issued by the Department of Agriculture. I do this for the reason that the causes and treatment, as given by Prof. Liautard are, so far as I know, accepted by all horse owners and veterinarians and taught by veterinary colleges. Prof. Liautard writes as follows: "As a consequence of the last-mentioned lesions of the tendons a new condition presents itself in the articular disposition, constituting the deformity known as the knuckling fetlock.

"By this is meant a deformity of the fetlock joint, by which the natural angle is changed from that which pertains to the healthy articulation. The first pastern or suffraginis loses its oblique direction and assumes another, which varies from the upright to the oblique, from before backwards, and from above downwards; in other words, forming an angle with its apex in front.

"*Cause*—This condition, as we have seen, may be the result

of chronic disease producing structural changes in the tendons, and it may also occur as the result of other affections or some peculiarity independent of this and situated below the fetlock, such as ringbone, sidebone or traumatic disease of the foot proper. Animals are sometimes predisposed to knuckling, such, for example, as are naturally straight in their pasterns, or animals which are compelled to labor when too young. The hindlegs are more predisposed than the fore to this deformity, in consequence of the greater amount of labor they are required to perform as the propelling levers of the body.

"*Symptoms*—The symptoms of knuckling are easily recognized. The changes in the direction of the bones vary more or less with the degree of the lesions. Sometimes assuming such a direction that it almost becomes a true dislocation of the pastern.

"The effect of knuckling upon the gait also varies according to the degree of the deformity. As the different degrees of the shortening of the leg affect the motion of the fetlock, the lameness may be very slight or quite extreme. Another consequence of this shortening is such a change in the position of the foot that the heel ceases to come in contact with the ground and assumes a greater elevation, and the final results of this is soon witnessed in the development of a club foot.

"*Treatment*—To whatever cause the knuckling may be ascribed, it is always a severe infirmity, and there is but little room for hoping to overcome it, unless it be during the very first stages of the trouble, and the hope dwindles to still smaller dimensions, when it is secondary to other diseases below the fetlock. If it is caused by overworking, the animal's first indication will, of course, be rest. Line firing has proved very efficacious in these cases. The animal must be turned loose and left unemployed. Careful attention should be given to the condition of his feet and to the manner of shoeing, while time is allowed for the tendons to become restored to their normal state, and the irritation caused by excessive stretching has subsided. A shoe with a thick heel will contribute to this. But if no im-

provement can be obtained and the tendons, though retracted, have yet been relieved of much of their thickening, the case is not a desperate one and may yet be benefited by the operation of Tenotomy—single or double—an operation expedient which must be committed to the experienced surgeon for its performance."

From the above quotation it will be seen that the cause of knuckling is always attributed to some condition below the hock, and treatment always applied to that part of the limb with acknowledged poor results.

That my position may be more easily understood I will divide knuckling into two classes: The one that is caused by an injury below the hock, when the seat of injury can always be detected, and lameness is usually present, to disappear when the condition has been relieved; the other, which develops where lameness is seldom present early enough in its development to cause us to suspect the one of being associated with the other.

Of the first class, which constitutes probably about 5 per cent. of all cases of knuckling behind, I have already referred to. Its cause can be easily detected and usually treated with success. Of the remaining 95 per cent. I think we have much to learn.

If we hope to relieve knuckling, we must do so in its incipient stage, and in order to do this, we must know its early cause.

As I said before, knuckling is a voluntary act; the change in the relation of those bones is made for the express purpose of relieving some part of the limb of its work, for we know that we cannot change the relation of any parts of the limb without causing a transfer of work from one part to the other. If the degree of knuckling increases, it signifies that a greater change in the relation of the parts is necessary that more relief may be extended to the affected part. And where lameness is present, it can be accepted as proof that the relief so extended is not sufficient to permit the affected part to perform its work with comfort.

That this is true is shown in the condition of spavin. When we have a lame horse and suspect a spavin as the cause, we look for certain symptoms and conditions that exist below the hock, and when found to exist, they always strengthen our diagnosis. The symptoms consist of the animal starting off slightly on the toe, with the weight inclined in that direction and a limited flexion of the limb at the hock. The conditions that we would expect to find would be knuckling of the ankle, an increased growth of the hoof at the heel, and, if of long standing, a very pronounced thickening of the tendons, but no heat, swelling or soreness can be detected. In cases of lameness we look upon these as symptoms of spavin, but they are the very same conditions found and described by Prof. Liautard as caused by knuckling. He refers to the change in the direction of the weight through the foot, for he says we have an increased growth of the heel. He says this growth may continue until we have what is known as a club foot, when the weight will pass through the toe in a vertical direction. He refers to the shortening of the flexer tendons and recommends tenotomy as a possible means of relief, but we, as well as he, look upon them as conditions caused by knuckling when lameness is absent, while when lameness is present we consider them symptoms of hock trouble. In the one case we look upon the conditions as a cause, while in the case of spavin, as an effect, to the extent of allowing their presence to strengthen our diagnosis.

There is probably nothing more difficult for us than to discriminate between cause and effect, for many conditions that at first are effects later become causes.

As a cause must precede the effect, it is hard to understand how thickened tendons and high heels can be considered as a cause of knuckling, when knuckling always precedes these conditions. As a matter of fact we see many horses that have been knuckled for years with normal heels and tendons. If this be true, then it is hard to understand how we can expect to relieve knuckling by lowering the heels or cutting the tendons.

When the conditions, referred to above, are present, they

will be seen to increase as the knuckling increases This would lead us to believe that one must be the cause and the other the effect; so if we exclude the high heels, etc., as a cause, we must look upon them as an effect, and accept the knuckling as the cause. For this reason we treat the ankle by blistering, firing, etc., but never with beneficial results.

No. 1.

These animals may continue sound and serviceable for years or may never take a lame step. Again, they may come from the stable some morning too lame to be put to work, as shown in the acompanying cut No 1. This animal had been used in a coal yard for the past seven years under my personal observation and care and had never gone lame. One Monday morning, after playing in the yard the day before, he was found too lame to be put to work, hardly taking any weight on one hind-limb. I had some liniment applied to the hock and allowed him to rest for a week, when he again traveled sound. But had this animal

continued lame for a month or more, there is no veterinarian who would not pronounce him lame in the hock. To confirm our diagnosis, we would point to the high heels and other conditions referred to in cases of knuckling and recognized by vetrinarians and many horsemen, as symptoms of hock joint lameness. The only condition never referred to and always present in those cases, as a symptom of spavin, is the knuckling. But why ignore the knuckling at this time? We haven't accounted for its presence; we haven't as yet determined whether it be a cause or an effect. We have admitted that it is not the effect of any of the conditions found below the hock, for it always precedes them; we cannot claim that it is the cause of these conditions, for we now acknowledge them to be well-recognized symptoms of a spavin.

If we have a cause, that cause can only be determined by its effect, and having acknowledged our failure to relieve knuckling by the treatment of any or all conditions below the hock, we are compelled to look upon it as an effect.

If knuckling be an effect, then where is the cause? This we must know if we expect to relieve it. When caused by an injury to the limb below the hock, we immediately and unquestionably recognize it as an effect, for the cause can easily be detected, and if we are asked why the injury causes knuckling, we will explain that it is the animal's effort to relieve the injured part of a portion of its work. If that be true in these cases, why is it not true in all cases of knuckling?

With this theory in mind, let us look to the hock. If a horse is lame from a spavin, this lameness signifies that that part of the limb is unable to perform its work with comfort, and instinct has taught the animal to relieve the parts by placing the limb in a position where the work of that part will be lessened. This the animal always does in a case of spavin lameness by voluntarily adjusting the parts to a position that will throw the weight in the direction of the toe. If the soreness increases, he will continue his efforts until the wall at the toe will be forced from an oblique to a vertical position.

Now we know that the more oblique the direction of the pastern bone, from behind to before, the more weight is thrown upon the heels, while the more vertical its direction, as seen in short-pastern horses, the more weight comes upon the toe. This anyone can determine by the wear on the shoes It will be seen by this that it would be extremely inconvenient for an animal to increase the weight in the direction of the toe, while allowing the ankle to continue in a position that will force it upon the heels. So it is quite natural that his first efforts will be to change the position of the bones from this angle and place them in a position that will lessen the angles and similar to the position they occupy in a short-pasterned horse. This can only be done by forcing the ankle upward and forward—the beginning of knuckling. As the ankle is forced forward, the weight on the heels is relieved, and the support they offer the limb has become lessened, and nature now comes to the rescue by increasing the growth of the wall at that point. If the condition of the hock requires it, these changes will continue until the ankle has formed an angle with its apex in front, and the length and direction of the wall at the heels will correspond to that of the toe and is known as a club foot. But this change in the contour of the limb necessitates other changes. What about the flexor tendons, whose ability to perform their work of flexing the limb depends upon their power to contract, but by raising the heels we have shortened the distance between their points of attachment, which is equal to increasing the length of the tendon, and it becomes necessary that they be shortened, and as they are shortened they become thicker, and this is the condition so often mistaken for a cause of knuckling.

As it has been admitted that injury to the tendon will cause knuckling, I wish to remind you of what was previously said. Where the injury is the cause, heat, swelling and soreness will always be present, and the knuckling is the result of the animal's efforts to relieve the work of the tendons by shortening the distance between their points of attachment, while the thickening found in the other cases is never accompanied by any of these symptoms.

When a horse has been lame for a long time from the effects of a very large spavin, we expect to find all of these abnormal conditons of the limb below the hock, and don't hesitate to say that they are caused by the spavin, but while a horse continues to go sound, we look upon them as a group of conditions peculiar to that part of the limb below the hock.

Before saying more upon this subject of knuckling and its cause, it might be well to say a few words about spavin. Most of us veterinarians, and nearly everybody who owns or drives a horse, think they can detect the presence of a spavin. To be reasonably sure of its presence they depend upon one of two things or both; either a bony enlargement on the inside of the hock that can easily be detected, or the character of the lameness, but few owners think a horse spavined if he is not lame. But if one will carefully study the condition in all of its stages in several thousand horses, he will find that it presents a very interesting study. We will see animals not showing the slightest enlargement at the seat of spavin so lame that they cannot be driven off a walk. We will see others showing quite a large spavin, but slightly lame, while again we will find others with a spavin as large as a hen's egg going perfectly sound and performing hard work.

Of those that go lame there are some that will start off on their toe and drive entirely out of their lameness, while others of this class will continue to show some lameness, but the heels will come upon the ground after going a short distance, to again go off on his toe and very lame if allowed to stand a short while; some will start off lame with the heels upon the ground and are slow to drive out of their lameness; some will start off lame with both heels upon the ground and continue lame, while others will start off sound and suddenly go very lame and continue so to the end of their journey, and likely for several days even refusing to put that foot on the floor when led out. This animal is likely to respond readily to treatment.

We have found among those animals a great difference in the condition and appearance of the hock, a great difference in

the character and degree of their lameness. There was but one condition always present—that was knuckling of the fetlock joint. This will be present to some degree where the slightest lameness exists.

If this is the only one condition that is always present, may we not consider it as a symptom of spavin?

Some years ago my attention was attracted by this condition of the ankle. The thing that interested me most was the fact that many of the worst cases did not show the slightest lameness, while many others showing but a slight knuckling were very lame. For this reason it seemed impossible the knuckling could be the cause of lameness and must surely be an effect, but as lameness was not always present it seemed hard to associate the one with the other. However, it became evident that when lameness was present the cause of lameness always existed in the hock joint, while in many of the worst cases of knuckling, when no lameness was present, a well-developed spavin could be found, and vice versa. Now this seemed a mixed-up affair, for there were knuckled horses showing no lameness, knuckled horses showing no spavin and spavined horses showing no knuckling, but always a knuckled horse when lameness was present.

At about this time there came under my care a number of colts sired by a spavined horse. They were well-bred animals, with fairly long pasterns. Before reaching the age of two years, every one showed a tendency to knuckle, and at the age of five years every one was knuckled and spavined. Those that remained free from lameness, the degree of knuckling remained about the same, while those that went lame showed a rapidly increased degree of knuckling. These animals, having a small and finely bred limb, rendered it easy to detect the slightest abnoramal condition, and a most careful examination failed to detect the presence of the slightest unsoundness below the hock.

A spavined horse going sound and showing no sign of knuckling, if from any cause of injury to the seat of the spavin he suddenly goes lame, he will immediately go knuckled, and continue knuckled until the lameness disappears.

If a spavined horse going sound and free from knuckling begins to show lameness, if the lameness is caused by the spavin, knuckling will always precede it. Should the ankle remain in its normal position, never treat the spavin, for it is positively not the seat of lameness.

As we know, a large percentage of spavins, some of which are very large, never cause lameness, while again many very small and some obscure spavins cause intense lameness, we are compelled to recognize some influencing factor other than its size. We all know that it is possible for a spavin to develop to an enormous size and never cause a minute's lameness. While it may be hard to explain these things, the fact remains that the proof is before us, so that while dealing with this condition we must confine ourselves to a study of the symptoms as manifested by the animal itself.

We may not know why some horses go sound with a large spavin and lame with a small one, but there are some things we do know, for the animal tells us as plainly as it can be told in the sign language. The trouble is we are not familiar enough with their language. However, we understand their reason for doing some things, for every animal will do the same thing when the same cause exists. For instance, if a spavin hurts a horse to the extent of causing lameness, that animal will invariably adjust the limb to a position where the weight is thrown more in the direction of the toe. His first move in an effort to do this is to change the relation of the bones at the ankle.

This is absolutely necessary, for he is powerless to change the direction of the weight on any part of the limb, unless he first changes the relation to each other of the parts that support the weight.

If the soreness increases, as manifested by the degree of lameness, a further change in the position of the bones at the ankle (increased knuckling) becomes necessary, this to be followed by the high heel, thickened tendon and other conditions seen in chronic spavin lameness. Of this group of conditions there is but one that can be designed or controlled by the animal

—the displacement of the bones, the condition known as knuckling. He is surely powerless to control the growth of the hoof or thickening of the tendons.

If high heels and thickened tendons are recognized as conditions that contribute to the comfort of the animal suffering from the effects of a spavin, and admitted that their presence is caused by and secondary to the knuckling, then we are compelled to accept the knuckling as the one and only symptom and the other conditions as an effect.

This makes it easy to account for some things that at first seemed difficult to understand, such as the presence of knuckling in the absence of lameness, or when a careful examination of the hock failed to reveal the presence of a spavin. For when we remember that many horses with very large spavins go sound with their ankle in a normal position, showing that no relief to the limb was necessary, it is only reasonable to think that others suffering a slight soreness could be relieved to the extent of going sound by a slight knuckling. If a slight knuckling relieves a slight soreness at the seat of spavin, then the degree of knuckling would depend upon the severity of the soreness.

If the soreness be sufficient to cause a slight knuckling at the time when it first begins to form and the development of the spavin checked, the degree of knuckling will remain the same. This condition is often seen in young horses. If a spavin can be relieved by knuckling and the degree of knuckling controlled by the will of the animal, why is it not possible under some conditions for the relief so given to permit of the full development of a spavin without the animal showing lameness, as shown in cut No. 1 and seen in many animals? The knuckling of these limbs continued to increase, the spavin continued to develop, and the animal continued to go sound, while performing his regular work. Everything seemed to be nicely adjusted to the requirements of the conditions he was subjected to, but when the animal, through play, kicked both hind-feet into the air, the jar occasioned by the weight of his body, when his feet were returned to the ground, passed through the limb in a dif-

ferent direction from that occasioned by work, with the result that he immediately went lame.

It is not uncommon for knuckled horses to suddenly go lame, and if the cause is at the seat of spavin, the degree of knuckling will immediately be increased.

I have nothing new to offer in the treatment of spavins. The form of shoe I apply will be referred to later.

It is better to try to prevent this condition than relieve it, and if knuckling can be accepted as a positive and never-failing symptom of an approaching spavin, it will prove a long stride in that direction, as it will permit of our removing the effect by treating the cause at a time when no other manifestations of its presence can possibly be detected. This might result in preventing the development of many spavins, lessen the degree of knuckling and number of knuckled animals.

It is generally acknowledged that a spavin is caused by too much strain being thrown upon that part of the limb, as a result, either of a peculiar or abnormal conformation of the limb, known as a hereditary cause, but more generally by an unbalanced limb.

When caused by the former, not much can be done to relieve it, but if caused by the latter, very much assistance can be given. For the amount of work performed by any part of the limb is influenced by the shape and position of the foot, and in many cases, where spavin lameness is present, the lameness can be relieved, often permanently, by simply adjusting the weight.

The method usually employed to relieve a spavined animal is the application of a shoe with thickened heels, but this is only contributing to the relief of a condition that now exists, and could not be useful as a means of preventing it. It seems very necessary that we make a nice distinction between the two, for the reason that many of us think that that which will relieve a condition, if employed sooner, might prevent it.

Horses that develop spavins are usually seen to stand high on the inside, with the weight passing through the foot in the direction of the outside toe, and for the reason that spavins usually develop very slowly, it is hard to determine if this is a

cause or any effect. While trying to determine this it is well to bear in mind that those animals with a foot with the outside wall nearly vertical from the heel to the outside toe are usually, if not always, spavined. Again a horse when first showing lameness, if he stands low on the outside, as he usually does, will often be relieved by raising that side of the foot. This coupled with the fact that we know the voluntary displacement of the foot, when seeking relief, is forward, as shown by the knuckling and high heels, leads me to look upon it as a cause.

If a low outside be accepted as a cause, it would be well to shoe him in a way that will not only place the limb in a balanced position when first shod, but cause it to remain in this position until he requires shoeing again.

No. 2.

Cut No. 2 shows the hind-limbs of a horse that was used for saddle work nearly every day for 22 years. During the last 18 years of that time I lived on the block where he was stabled, and saw him in use many times during each week. All of this time the animal went sound behind.

The position of both ankles corresponded to the position of the right ankle, as seen in the cut; and while the wear on the shoe was greater in the direction of the toe, the hoof retained its normal shape. The inside of both hock joints were smooth,

but slightly "rounded," and he would be a brave, but indiscreet man who would attempt to convince the owner, or any horseman, that this animal was spavined in both limbs.

One morning following his average drive of the day before, he was found in his stall so lame in the left hind-leg that he refused to do more than touch the toe to the floor when compelled to move.

The position of his ankle was now very much flexed, as shown in the cut. The ankle was placed under treatment for three weeks by the owner, and as he showed no improvement and was about 27 years old, he decided to have him destroyed.

I saw him for the first time, since getting lame, passing my place on the way to be destroyed. I asked that he be left with me for an hour, which was done. I immediately took the pic-

No. 3.

ture as shown in cut No. 2. I then cocained the seat of spavin, and in 20 minutes took the picture shown in cut No. 3.

The lameness was now very much relieved, and, as shown in the picture, the knuckling was very much reduced.

The animal was taken a distance of about half a mile, when the owner called me up on the 'phone and said he was going sound and acting like a two-year-old, and he didn't think he would have him destroyed, but after I had explained the case to him he was put to death, and I got the limb. Upon dissection

the condition of the tarsal and metatarsal bones on the inside of the joint would cause one to wonder how this animal had continued to perform work without showing lameness.

I know I have already overtaxed your patience, but I feel that I would not be fulfilling my obligations as a veterinarian, if I allowed this opportunity to pass without saying a few words about the use of the old-fashioned three-calked shoes, for I consider them responsible for more spavined horses than all other conditions combined.

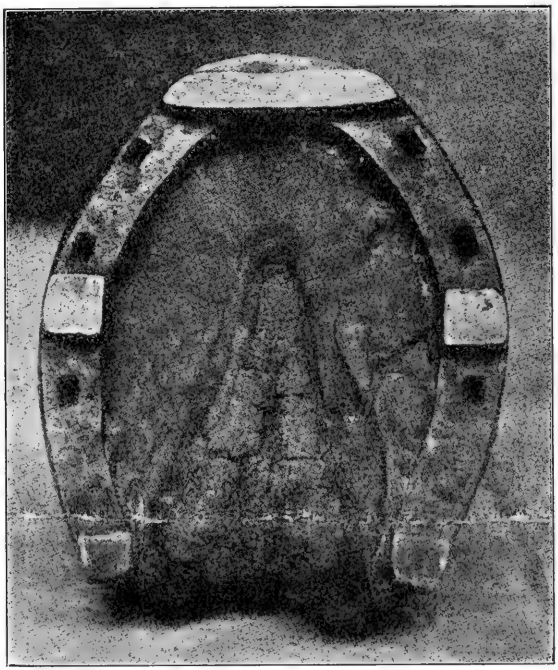
The broad quarters of the unshod hoof provides the limb on either side with sufficient support to prevent its rotating in that direction, but place a three-calked shoe upon a table and attempt to rotate it, and you will find that absolutely no resistance is offered to its displacement in the direction of either side. How could there be? As the support, provided by the shoe, corresponds to the length of the toe in front and the distance between the two heels behind. It robs both sides of the limb of every particle of its support. There is no one who can deny this statement and, unless we are prepared to prove that support at that place is not essential to its health and comfort, there should be a law passed prohibiting the use of such a shoe.

I consider it a waste of your time to dwell longer upon this subject. The evidence of the injurious effects of such a shoe is too apparent to make it necessary to point it out to this intelligent body of men, but I cannot help but express my surprise that we, as veterinarians, have not taken a more active part in trying to abolish their use.

The long and continued use of these shoes can only be accepted as proof of the amount of suffering they have caused millions of horses, as well as a loss of service to their owners, and cannot be offered by us as a reason why their use should be longer continued, when conscious of their injurious effects upon the limbs.

When a horse is lame in the hock, I always apply a shoe as shown in cut No. 4. In very many cases, when the animal first goes lame, no other treatment is required, and my experience

along this line with hock-joint lameness has convinced me beyond any question of doubt that the support provided by the two



No. 4.

calks situated under the quarters is essential to the comfort of the limb.

Summary.

That breaking over (stumbling behind) is always caused by a slight knuckling, when the weight comes upon the limb. That knuckling is always present when there exists any condition of the hock joint, at the seat of spavin, which renders that part of the limb unable to perform its work with comfort.

That absence of knuckling in cases of lameness behind can be accepted as proof positive that the cause does not exist in the region of the inside of the hock joint, no matter how large the spavin is that may be found there.

That absence of support under the quarters is responsible for more hock-joint lameness than all other causes combined. That there exists on the inside of the hock joint of 75 per cent. of all horses, more than six (6) years of age, an abnormal condition, the result of strain, which renders that part of the limb less able to perform its work.

Now, gentlemen, I thank you for your attention and display of patience, for I know I have said some things that seem radical to many of you, but I solicit your careful investigation of this subject and assure you that I am willing to abide by your findings.

I will now conclude by asking that this association be appointed as a committee to determine the effects of three-calked shoes upon the limbs of horses. And if in their opinion the use of these shoes are as injurious as claimed by me, that this association at their next regular meeting, if they deem it wise, take some action to prevent the use of any form of shoe that does not provide the sides of the limbs with support equal to the support offered by the quarters of the unshod hoof.

HORSE POPULATION IN UNITED STATES INCREASED 58,000 IN THE PAST YEAR; BUT FOOD PRODUCING ANIMALS HAVE DECREASED.—Statistics of the United States Department of Agriculture show that on January 1, 1913, the total number of horses on farms and ranges in the United States was 20,567,000, valued at $110.77 per head, with an aggregate value of $2,278,222,000. Compared with January 1, 1912, horses had increased 58,000; mules increased 24,000; milch cows decreased 202,000; other cattle decreased 1,230,000; sheep decreased 880,000; swine decreased 4,232,000. In average value per head horses increased $4.83; mules increased $3.80; milch cows increased $5.63; other cattle increased $5.16; sheep increased $0.48; swine increased $1.86. In total value horses increased $105,528,000.

DR. JAMES B. COUGHEY, an old subscriber to the REVIEW, died recently at his home in Pittsburg, Pa., at the age of 53 years; apoplexy being the cause of his death. Dr. Coughey was a government veterinary inspector for a number of years. He is survived by a widow and one daughter.

THE TUBERCULOUS COW IN RELATION TO HUMAN HEALTH.*

By M. H. Reynolds, St. Paul, Minn.

Prevalence.—I have the impression that the prevalence of bovine tuberculosis is not usually appreciated by physicians and sanitary workers in the human field and feel that I should first of all emphasize this matter of prevalence. We have more or less of it all over this country where there are cattle; more prevalent, of course, in city dairy herds and in pure bred herds; less prevalent under range conditions, but it exists, more or less of it, practically wherever there are cattle.

Wherever there are tubercular cattle there are tubercular hogs, as a very general rule. In fact, it has come to be recognized in recent years that a herd of hogs intimately associated with a herd of cattle gives a very reliable means of diagnosing tuberculosis among the cattle of that farm.

Abundant statistics are easily available showing prevalence of bovine tuberculosis in Massachusetts, Maine, New York, Pennsylvania, Maryland, Minnesota, Wisconsin, Nebraska and other states. From these states we have reliable evidence that should be accepted as satisfactory by any scientific man for the prevalence of tuberculosis under all possible conditions of breeding, stabling, and even lack of stabling.

The following figures may be startling to those who have not been studying this question. I quote from reports of the Federal Bureau of Animal Industry.

Cattle and hogs inspected and carcasses condemned, 1901 and 1905. (Bear in mind that approximately only one-half of tuber-

* Presented at a joint session of Minnesota Association for the Prevention and Relief of Tuberculosis with State Conference of Charities and Corrections, Austin, Minn., October 27, 1912.

cular carcasses are condemned; *i. e.*, one-half of tuberculin reactors.)

1901	Cattle carcasses inspected	5,219,149
	Condemned carcasses	6,454
1905	Cattle carcasses inspected	6,096,597
	Condemned carcasses	10,956
1901	Hogs carcasses inspected	24,642,753
	Condemned carcasses	8,650
1905	Hogs carcasses inspected	25,323,984
	Condemned carcasses	64,919

The following table shows the number of animals of each kind slaughtered under government inspection during the fiscal year ending June 30, 1908, and the number and percentages found affected with tuberculosis. Note in hogs and cattle going to market an enourmous increase in proportion of the tubercular.

	Number Slaughtered.	Number Tuberculous.	Percentage Tuberculous.
Cattle	7,116,275	68,395	0.961
Hogs	35,113,077	719,309	2.049

The comparison here is on a somewhat different basis from the preceding for years 1901 and 1905. In the one case "carcasses condemned," in the latter "proportion found tuberculous."

The actual situation is undoubtedly better than these figures would indicate, for the inspection was probably more rigid and careful in 1905 than in 1901 and better still in 1908. The inspection of swine carcasses has been much more thorough during the past few years. Further, the number of known tuberculous cattle sent to the abattoirs has increased greatly on account of rapidly enlarging state and municipal work with the tuberculin test.

But the critical student of the tuberculosis situation will soon convince himself that these considerations do not explain the

difference between the figures of 1901 and those of 1908, nor for any similar period that might be selected.

I presume the best general statement now available as indicating the general prevalence of tuberculosis among cattle is one made a few years ago before an international congress on tuberculosis by Dr. Melvin, chief of our Federal Bureau of Animal Industry. This was to the effect that during a period of 15 years preceding 1908 they had received reports of 400,000 tuberculin tests from all over the country. These showed on a large average 9.25 per cent. reactions. Veterinary sanitarians will all agree that this is higher than would be shown if it were possible to test all cattle of the United States at any one time, for the reason that while much of the testing was done indiscriminately in the course of city and state work, some of it was done with herds that were already suspected and therefore presumably in bad condition.

It may be interesting to note how Minnesota stood in this series of 400,000 tests collected by government officials. Including only individual states from which 1,000 or more tests were taken, the average percentage of tuberculin reactions ranges all the way from the lowest figure, 4.56 per cent. for Maine, to 25.14 per cent. for New Jersey. Minnesota's showing is 4.99 per cent. Vermont shows 6.54 per cent. Massachusetts 13,75 per cent.

In the course of some work at the Minnesota Experiment Station a few years ago I had occasion to study the prevalence of

Class	Number of Herds Tested.	Number Animals Tested.	Number Reactions.	Per Cent. Tuberculous.
Natives	137	2,839	223	7.8
High grades	5	157	17	10.8
Pure breds	6	258	43	16.6
With "fair ventilation"	45	1,087	67	6.16
With "poor ventilation"	48	1,210	201	16.6

bovine tuberculosis under specific conditions of stabling and breeding. We investigated the stabling and breeding of something over 3,500 cattle tested with tuberculin with a showing of results that should be interesting to those engaged in the work of sanitation. Yet the actual conditions correspond very closely with what any well informed person should expect.

Minnesota's showing for the year ending August 1, 1908, was for pure bred cattle tested 1,329, of which 36.8 per cent. reacted. Of grade cattle there were tested 25,887, of which 7.7 per cent. reacted. The average percentage of reactions among cattle for the year regardless of breed was 9.3 per cent. I would call attention to the very close agreement of Minnesota's average for this year with the general average for the United States, 9.25 per cent. for the 15-year period reported by Dr. Melvin.

Under the new law, which took effect January 1, 1910, ordering official tuberculin test of pure bred cattle sold for breeding purposes, there were tested during the first seven months 3,035 cattle with 11.2 per cent. reactions. For the following year, which began August 1, 1910, 1,717 cattle were tested, of which 1,214 were given their second test with only .9 per cent. reactions. These figures quite plainly suggest the serious prevalence of tuberculosis among pure bred cattle and the possibility of controlling the disease in this particular class of cattle.

It has occurred to me that it might be helpful for those who are fighting tuberculosis in the human family to know something concerning our Minnesota state work with tuberculosis among cattle.

Minnesota in Relation to Bovine Tuberculosis.—By state laws and official regulations it is provided that when a herd is tested in Minnesota and cattle react, the usual procedure in order of occurrence is appraisal of reactors on the owner's premises; shipment to South Saint Paul or to any point within the state where there is a packing plant and provision made for federal inspection. Such cattle are sold in the regular channels of trade subject to inspection. The owner receives the carcass, returns whatever that may be and three-quarters of the difference between

carcass returns and the appraisal, this difference being paid directly from the state treasury.

Admitting that tuberculosis is a common disease among cattle, there is required only a little knowledge of bovine tuberculosis, a bit of practical knowledge of cows and stables and an ordinary measure of common sense to realize that there are in constant operation, easy and frequent means of transfer from the bovine to the human.

Abundant Opportunity and Means of Transfer to the Human.

It is a matter of common knowledge among veterinarians and pathologists in general that cows have open lesions of the respiratory organs; that cows do cough and spray out material from the mouth and pharynx; that cows, unlike horses and some other animals, usually or always swallow any discharge reaching the nose or pahrynx. Any infection in this material is, of course, liable to be discharged in the feces. It is equally well known that cows have open tubercular lesions of the intestines which constantly and certainly infect the bowel contents. It then becomes just a matter of plain common sense to see how easy it is to develop a general contamination of mangers, feed boxes, atmosphere, and stables in general from cough or from bowel discharge or from both.

Contamination of milk is a disagreeable phase of the question but one which should not be ignored in this discussion. Some tubercular cows have been proven beyond question to pass virulent tubercle bacilli from the bowels. In our own experimental work at University Farm, Reynolds and Beebe(1) found one cow, a fat and very handsome pure bred polled angus cow that was constantly passing abundant and virulent tubercle bacilli in the manure. We were able to reproduce tuberculosis in guinea-pigs at will by simple direct inoculation from a cotton swab

(1) Dissemination of Tuberculosis by the Manure of Infected Cattle, Minnesota Experiment Station Bulletin No. 103.

thrust into the nostril; in other words, the nasal secretion and the feces of this cow were both constantly distributing virulent tubercle bacilli.

Schroeder has reported in detail work showing beyond question that tubercular cows do pass virulent tubercle bacilli in the bowel discharge. Everyone who is at all familiar with cow stables and milking knows how extremely easy it is for fine particles of dry manure from the tail or flank or udder to gain access to the milk pail; in fact, some little care in the way of wiping with damp cloth is necessary to prevent this. The suggestion is obvious. Granted a tubercular cow giving milk and it does not require a very vivid imagination to trace a virulent bovine tubercle bacilli from the cow to the susceptible child for whom raw cow's milk constitutes the sole or most important article of diet.

The British Royal Commission agrees in its final report with statements of many individual workers on another point that has become a matter of common knowledge among intelligent veterinarians; namely, that bovine tubercle bacilli are almost certainly found in milk from udders having tubercular disease; and that virulent bovine tubercle bacilli may and frequently do appear in milk from tubercular cows having apparently quite normal udders. This, of course, does not say that such bacilli always come through the udder. The contamination may occur in the pail.

We can safely assume that cows are frequently tubercular; that they have open lesions; that there are frequent and easy opportunities for transfer. Are tubercle bacilli from the bovine virulent for the human?

Virulence of Bovine Bacilli for the Human.

Types of Bacilli.—The British Royal Commission in its final report, 1911, recognized three types; human, bovine and avian. This grouping is commonly accepted and has been for several years. The avian type has no important bearing in this discussion. Leaving this out of consideration this commission states

plainly that it prefers to regard the two types; *i. e.,* the bovine and human type of the bacillus, as simply environmental variations of the same bacillus and the lesions which they produce are regarded as manifestations of one disease. They experimented with a large variety of animals and say that the disease produced in susceptible animals by both types of the bacilli are histologically identical.

They report in plain words investigations of many instances of fatal tuberculosis in the human where the disease was undoubtedly caused by bacilli of the bovine type and that alone. Comparing these lesions histologically and otherwise with similar fatal cases due to bacilli of bovine origin, they conclude that the lesions were anatomically indistinguishable. This great commission after years of study unhesitatingly adds man to the list of animals notably susceptible to bovine tubercle bacilli.

Referring to variations in virulence of tubercle bacilli at the International Congress on Tuberculosis four years ago Arloing, a great Frenchman, made the following statement:

"From the standpoint of hygïene, they emphasize the unity and fusion of the classic types and demonstrate the necessity of taking precautions against the tuberculous virus, whatever may be its origin."

At the same congress Fibiger and Yensen, of Copenhagen, announced the following conclusions in connection with an address on the relations of human and bovine tubercle bacillus:

"There are some cultures, however, that must be considered as transition forms, having some of the characteristics of the bovine and others of the human eye."

There is available plenty of clinical evidence of intertransmission. Repp collected a series of 32 human cases of tuberculosis from the bovine. These had been carefully studied and accepted by such men as Hills, Denne, Ernst, Pfeiffer, Law and Ravenel as evidently due to bovine bacilli. In the judgment of these men the circumstantial evidence was so clear and so complete as to give a strong probability that the cases were due to infection from the bovine. Plenty of such collections are avail-

able. There are pages and pages available for any one who wishes to study this question. Moss(2), of John Hopkins University, has collected and reports 16 cases of cutaneous infection in the human in which either the bovine bacillus was found or case histories and clinical evidence gave a clear and strong probability of bovine origin. These 16 cases were studied and accepted by such men as Tschering, Smith, Ravenel, DeJong. In this same series collected by Moss are 40 alimentary tract cases in the human. These cases were studied and accepted by such men as Ernst, Adami, Ever, Johne, Ravenel, Bang, Klebs, Bovaird. In addition to these skin and alimentary cases there are plenty of cases of cervical adenitis with laboratory demonstration of bovine bacilli origin.

The British Royal Commission has given us several interim reports and a final report after years of work. The German Royal Commission and other commissions have reported after apparently unbiased and competent study of these questions. Their reports are easily available, their statements positive and clear.

The final report of the British Royal Commission in 1911 presents information which sanitarians can not reasonably belittle or ignore. This commission has set for its task to inquire and report:

First, whether the disease in animal and man is common and the same. *Second,* whether animals and man can be reciprocally infected with it. *Third,* under what condition, if at all, the transmission of the disease from animal to man can take place and what are the circumstances favorable or unfavorable to such transmission.

It was evident from the start that answers to these questions which could be accepted by scientific medical men must be based upon work conducted on a large scale and through a long period of time. Animal work was conducted upon actual farms with actual cattle as well as in the laboratory.

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(2) The Relation of Bovine to Human Tuberculosis, Johns Hopkins Hospital Bulletin 20, Number 215.

In their first interim report issued in 1904 the commission stated that they had inoculated cattle with bacilli of the bovine type derived from the human and produced generalized tuberculosis in the bovine.

In their second interim report of 1907 it was shown that fatal cases of human tuberculosis had been proved, due to bacilli typically of the bovine type, but added that all cases examined up to that time was abdominal tuberculosis and occurred in infants and children.

The final report of 1911 states that it has been proved that fatal cases of phthisis in the human adult may be caused by typical bovine bacilli. You will remember that Dr. Koch, after his memorable address of 1901, conceded in 1908 that fatal cases of mesenteric tuberculosis might be caused in children by bovine type bacilli, but still insisted that all cases of phthisis in the adult were due to bacilli of the human type.

The British Commission recognized in its final report in positive statement that man is clearly suspectible to at least two of the three types of tubercle bacilli; *i. e.,* to the bovine and human.

A summary of cases studied and presented by this commission shows in one connection 128 cases of tuberculosis in the human adult. Very few lung cases in this list were referable to the bovine tubercle bacillus, but their report for abdominal tuberculosis and especially for children was very different. Nearly one-half of the studied cases in young children which died from primary abdominal tuberculosis were attributed to the bovine bacillus alone.

Some of the best work that has been done by those who are studying this question has come from the Research Laboratory of the Department of Health, New York City. I can only call your attention here to a few features of one of the latest reports from Dr. Park and his associates. This appears in the *Journal of Medical Research* for September, 1912.

In a careful study and tabulation of cases reported by others they have summarized a study of 252 tuberculous children under

five years of age. Of these 252 there were 201 due to the human type of bacillus and 51 to the bovine type of the bacillus, about 20 per cent. due to the bovine type. Park and his associates had already reported a study of 478 cases of human tuberculosis and in this later publication they have combined their 478 cases with those previously mentioned as reported on by others. The combined showing is a total of 1,511 cases of all ages. There were 368 cases among children under five years of age. Of these 368 cases 292 were due to bacilli of the human type and 76 to bovine tubercle bacilli, if there be two distinct varieties. If, on the other hand, we accept the unity of tubercle bacillus, then tuberculosis of the bovine becomes at once identical with human tuberculosis. You see it makes no difference which horn of the dilemma may be taken by those who belittle the importance of bovine tuberculosis. He can have his choice and accept on the one hand two types with 20 per cent. of the cases in children under five years of age reported by others and accepted by Parks and his associates and a trifle over 21 per cent. in the combined series of 368 cases in children under five years of age; or he may accept the unity of the bacillus and identity of disease.

The location of tuberculosis due to bovine infection as shown in this recent study by Parks is interesting. Suppose we omit from this study by Parks and associates all but the fatal cases in children under five years of age, a comparison of infections with bacilli of human and bovine types shows as follows. The following figures are for total cases reported and exclude mixed infections:

Of total 13 cases of abdominal tuberculosis in children under five years of age there were three due to the human type and ten due to the bovine type of bacillus.

Of generalized tuberculosis of alimentary origin in children under five years of age, 30 cases, there were 16 due to bacilli of human type and 14 for the bovine.

Of 69 cases of generalized tuberculosis, regardless of origin, there were due to the human type bacilli 64; bovine 5.

Of 15 meningeal cases, secondary to tuberculosis of alimen-

tary origin, there were due to human type bacilli 5 and bovine 10.

This series of 237 cases includes 91 fatal cases in young children investigated by Parks and his associates added by these workers to those previously reported by others. In their own series of fatal cases of non-selected tuberculosis in children under five years of age 12.5 per cent. were due to bovine infection. In their list were included nine cases from a foundling asylum and fed exclusively on cow's milk. Of this particular group, five were plainly of bovine infection.

In view of the present information it appears to me surprising and regretable that health officers and even practicing physicians should ever be inclined to ignore or belittle a reasonably probable, important relation between bovine and human tuberculosis. This is surprising in the face of a large amount of carefully reported statistics and practical clinical experience. If it can be shown, as it undoubtedly has been, that a few or any cases of human tuberculosis are due to directly to infection from bovine, it seems logical and reasonable to infer that these persons are not unique and that there must be others susceptible. A disease or an infection which destroys any human life is of itself a serious matter and can not be reasonably ignored.

Frazier, reporting from the Research Laboratory, Royal College of Physicians, Edinburgh (see *Journal of Experimental Medicine* for October, 1912) presents a study of the relative prevalence of human and bovine type of tubercle bacilli in bone and joint tuberculosis of children.

He reports for a total of 70 cases studied. All were of children under 12 years of age, with exception of three cases. Of the total 70 cases 39 were point disease, 31 bone disease. Each individual case was worked out systematically along lines that are fully reported.

Of the total 70 cases the bovine bacillus alone was present in 41; the human bacillus alone in 26. Both forms were found in three cases.

The associated study of age, family history, milk supply and

environment is interesting. This series of cases is significant because the study is confined to a specific age limit. Associated family histories showed for children under one year four cases, all four due to bovine bacillus.

One to two years, 12 cases, 8 due to bovine, 2 to human, 2 bovine and human.

Two to three years, 15 cases, 11 to the bovine and 3 to the human type of bacillus, one bovine and human. After three years of age the proportion due to human bacillus gradually increases. In this series there were no more cases due to mixed infection with both types after three years. This, of course, may have been merely a coincidence.

The family histories gave interesting data. Where there was family history of tuberculosis 71 per cent. of the cases were due to the bacilli of human type. Where there was no family history of tuberculosis only 17 per cent. were due to the human type and approximately 82 per cent. of the bovine type.

So far as the milk supply was concerned it is shown in this study that there were a number of children less than one year of age that had been nourished entirely upon cow's milk and in these cases only the bovine bacillus was found. In the total 12 cases under two years of age there were 8 due to bovine bacillus and each had been fed from birth upon cow's milk.

The general conclusion is that a serious proportion of bone and joint tuberculosis among children in Edinburgh is due to the bovine bacillus coming from cow's milk.

There has been a most unfortunate tendency for medical opinion and public opinion so far as the latter has been guided by the former to swing from one extreme to another in its view of this problem. Not long since we were told by great men who were considered authorities that people commonly became tubercular as children; that the chief route of infection was through the as yet imperfectly fortified alimentary canal; and the inference was plainly given that since cow's milk constituted the most important or sole article of diet of many young children that therefore cow's milk was the great offending factor—

an extreme view, of course, and not resting on any careful scientific demonstration.

Later, and we are just emerging from that period now, came the other extreme, a tendency to belittle or even ignore bovine tuberculosis as an important factor in human tuberculosis.

In a communication to the Sixth International Congress on Tuberculosis in 1908 Sims Woodhead, Cambridge, closed his address as follows:

"As for myself, I am so satisfied with the nature of the evidence that has already been obtained, not only in England but in Germany, in France, in Denmark, not to speak of important investigations carried on in other countries, that I am unwilling to countenance the relaxation of a single regulation for the control of bovine tuberculosis. Indeed, I will go further, and state my strong conviction that in the interests of hygiene, and with a view to the final stamping out of tuberculosis from the human race, additional and more stringent regulations will undoubtedly have to be drawn up and applied."

It has been my privilege for several years to associate rather closely as a member of the International Commission on Control of Bovine Tuberculosis with the members of this body. I have been with them in commission sessions and in private conversations repeatedly and feel sure that not one of the 14 members now has any question concerning the frequent transmission from bovine to human or that this is an important phase of the question. On this commission are such men as Ravenel, V. A. Moore, Mohler, Hodgetts, Hurty and Schroeder. Dr. Hodgetts represents the public health officers of the Dominion of Canada. Dr. Hurty, secretary, State Board of Health, Indiana, was selected to represent American health officers. There are 14 members on this commission, but these are the men whom we consider our guides for this particular phase of the problem. In the reports of this commission occur such statements as the following, adopted without any dissenting vote or opinion:

"Young children fed on such milk (milk from the tubercular cow) often contract the disease and it is a frequent cause of death among them."

I remember distinctly that the exact wording of this sentence was given careful consideration and the sentence stands in its report exactly as the commission believed that it should stand.

Again this commission states "that all milk and milk by-products used as food (human) should be properly pasteurized, unless from cows known to be free from tuberculosis."

The British Royal Commission consists of such men as Sir Michael Foster, Sims Woodhead, Sidney Martin, Sir John McFadyean, Robert Boyce and Sir William Powers, and has studied this question. The International Commission on Control of Bovine Tuberculosis, the German Commission, and many individual workers have studied this question carefully and thoughtfully and they agree that whether the bacillus of bovine tuberculosis and the bacillus of human tuberculosis be mere varieties of one specific organism or are two distinct types, incapable of converging mutations, the tubercular cow must be considered as an important factor, and as a direct cause of tuberculosis in the human.

Surely there is but one reasonable—only one safe position to take regarding the tubercular cow. It is that she is an important—not the most important, but an important source of tuberculosis for the human, and that under present conditions she is an ever present constantly operating menace to human health.

THE RECENT MEETING OF THE MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION AT LANSING was probably the most largely attended in the history of the organization and, in fact, was in every sense an exceptionally good meeting. The proceedings of this association have attained such volume and importance as to make their publication advisable; and a publication committee was therefore appointed at the last meeting. The following gentlemen were elected to guide the affairs of the organization the coming year: Dr. G. D. Gibson, president; Dr. R. P. Lyman, 1st vice-president; Dr. M. J. Smead, 2d vice-president; Dr. H. A. Haynes, 3d vice-president; and the re-election of Dr. W. A. Ewalt, of Mt. Clemens, as secretary-treasurer; so that the success of this active body for 1913-14 is assured.

THERAPEUTICS.*

By H. D. Bergman, D.V.M., Physiologist, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.

The general term Therapeutics certainly covers a multitude of sins. Primarily, the term is derived from the Greek "*Therapeuo,*" meaning "to attend upon," and as now used comprises all the science and art of healing, and includes the use of drugs and all other agents and measures which are known to alleviate pain or favorably influence diseased conditions. Hence, it may be seen that any treatment from the administration of the proverbial bull-frog per orem in impaction with the idea that he may burrow his way to freedom via the anus, to the scientific administration of vaccines and serums might be included in the general term Therapeutics. Even the operations of Nature herself are properly embraced in this term. Therefore, in order that we may understand upon just what basis we are working, we usually subdivide therapeutics as follows, namely, into natural and applied therapeutics, and we may further subdivide applied therapeutics into empirical and rational therapeutics.

Natural therapeutics includes the great and all important healing powers of Nature, whose processes occur independently of art and tend to the spontaneous decline and cure of disease. There is no scientific dogma, or doctrinal notion asserted without regard to evidence, better established than this, "that the living organism is in itself adequate to cure all of its curable disorders." This natural law sustains the medical skeptic in his infidelity as to the value of medicines, enables the crudest quackery to report cures, and helps all of us out of more close places in practice than we are generally willing to acknowledge. While scientific medicine admits and welcomes the indispensable assist-

* Presented to the twenty-fifth annual meeting, Iowa Veterinary Medical Association, Ames, November, 1912.

ance of nature in fighting diseased conditions, yet the art of applied therapeutics, embracing the applications of agents foreign to the living organism for the purpose of aiding nature to restore the body to a healthy condition, is now recognized as a subject as broad as the universe. We may subdivide applied therapeutics into empirical and rational therapeutics. By empirical therapeutics we mean the use of certain therapeutic agents, for the sole reason that they have been tried previously with successful results in cases apparently identical with the one under treatment, or in other words, it is merely an elaboration of Mrs. A recommending Mrs. B to use peppermint tea because it cured Mrs. C of the very same trouble. Empirical therapeutics, sometimes styled the therapeutics of experience, was the original method in therapeutics and has certainly conferred many rich gifts upon medical science. The use of salicylic acid in rheumatism, potassium of iodide in various paralyses, arsenic in anorexia and cachexia are examples of empirical use of remedies. Permitted to reign supreme, empirical therapeutics would be destructive to all exactness in therapeutical progress, as the so-called experience of one observer is too often overbalanced by the experience of another equally competent, and also, as failures are seldom reported, there can be no scientific comparison of the failures with the reported successes. So it may be seen that empirical methods alone tend toward a minimum degree of accuracy in a science, which in the very nature of things can never be exact.

Rational therapeutics means the use of remedies for reasons based upon knowledge of the pathological conditions present in the subject and the physiological action of the agent employed. This method is the very antithesis of empiricism, and has been the leading idea in every revolt against empirical therapeutics in the past, and many of our old doctrines, such as Stimulism, Chemicism, Galenism, etc., originated in efforts to find a more rational system than the prevailing methods of their day of administering medicine. Albrecht von Haller, the father of physiology, was the real originator of modern physiological thera-

peutics, his dogma being that "drug proving is the only true basis of drug using." This idea is now inspiring the minds of medical scientists and students all over the world. Medical colleges are recognizing physiological drug experimentation as a part of their regular curricula; laboratories are being fitted up with costly instruments of precision for the more exact prosecution of this study; and systematic researches are being conducted upon animals to ascertain the physiological action of every agent hitherto used in medicine. The alkaloids and other active principles of vegetable drugs, together with the numerous synthetic compounds which chemistry is giving to medicine, are subjected to the same rigid experimentation, and the various medical journals are being filled with the results of this work. Hence the conviction that physiological experimentation with drugs must be the basis of their proper therapeutic employment is certainly and rightly growing into a fixed law of professional belief, and the future advance of experimental therapeutics depends on the cooperation of pharmacological and clinical experimentation.

A Few Drugs and Their Practical Application.

Perborate of Sodium.—Perborate of sodium is a white, odorless, tasteless peroxide powder, which may be applied to wounds, bruises, abscess cavities, ulcerative surfaces, hemorrhages, etc., either in powder form or solution, as dissolving the powder in water forms an alkaline solution of hydrogen peroxide, the germicidal power of which is greater than that of ordinary hydrogen peroxide solutions. Sodium perborate solutions seem to have numerous advantages over hydrogen peroxide solutions, namely, they are alkaline in reaction, rather than acid, as are the majority of hydrogen peroxide solutions. Solutions of any strength desired may always be freshly prepared, as the powder is very stable, while hydrogen peroxide solutions deteriorate rapidly after opening, and hence one cannot be certain as to the strength of solution he is using. Perborate solutions contain sodium borate and sodium carbonate or hydrate, while hydrogen peroxide solutions contain sulphuric or phosphoric acid, barium

salts and often preservatives. The oxygen evolved by the use of perborate solutions or by the powder, when it is brought into contact with moist surfaces, not only acts as a powerful germicide, but tends to renew and vitalize worn-out and diseased tissue, for the value of active oxygen as germicide as well as a healing agent is now firmly established by science as well as experience. Perborate of sodium powder of solutions are also valuable for their deodorant properties in cases of excessive mucous secretion, oral fetor, etc. In cases of hemorrhage the powder, if applied, shows a marked styptic action, checking the blood flow rapidly. The solubility of perborate of sodium is limited to 20 to 30 grams or approximately one ounce to a quart of water at ordinary temperature. Such a three per cent. solution amounts to two volumes of hydrogen dioxide, which would be approximately a twenty per cent. solution of hydrogen peroxide, or a one to five thousand solution of bichloride of mercury. By raising the temperature of the water to not over 105 degrees F. the solubility gradually increases, or by adding a few grams of citric, tartaric or other acids the solubility may be increased until a ten to forty per cent. solution may be derived, or a solution of two to three times the germicidal strength of hydrogen peroxide. We have observed excellent results from the use of the powder as a dry dressing in a variety of suppurative conditions in preference to various other antiseptic ducting powders.

Alcohol.—The value of alcohol and alcoholic solutions as antiseptics and disinfectants has been the subject of a number of researches lately, particularly by two Germans, Alfred Beyer and Schumburg. One would naturally suppose that absolute alcohol, which contains not more than one per cent. by weight of water, would be the most powerful alcoholic germicide. Such, however, is not the case, for it has been shown that alcohol fails to penetrate and destroy the organisms, unless in the presence of water. Hence dry bacteria or bacteria dried artificially are not killed when exposed to absolute alcohol; in fact, the alcohol seems to preserve them by abstracting moisture. Certain dry bacteria may be exposed to absolute alcohol for twenty-four hours without losing any of their vitality. However, absolute

alcohol will kill moist bacteria, and bacteria in bacterial fluids die almost immediately when exposed to absolute alcohol. Hence it may be seen that alcohol fails to penetrate the organism, unless in the presence of a certain amount of water. According to Beyer, a 70 per cent. solution of alcohol by weight, which equals approximately a 76.7 by volume, showed the highest bactericidal power, being thirty times as effective as a 60 per cent. solution, and forty times as effective as an 80 per cent. solution. In fact, he says that solutions under 60 per cent. of over 80 per cent. by weight are comparatively useless for all practical purposes. Higher concentrations than 70 per cent. are comparatively inactive, since they contain such a small percentage of water that the alcohol through its hygroscopic properties tends toward drying and preserving the bacteria rather than penetrating and destroying them. Mixtures of alcohol with chloroform, ether, benzol, acetone, glycerine, etc., do not exceed properly diluted aqueous solutions of alcohol in bactericidal power. Neither are the actions of phenol, lysol, creoline, etc., appreciably increased by dissolving in alcohol. Alcoholic solutions of iodine, such as the tincture of iodine, probably exceed all other antiseptics in germicidal power, killing anthrax spores in one minute. Weak solutions of iodine, even as low as ¼ per cent., have proven themselves effective against stphylococci. Decolorized tincture of iodine is inferior to the tincture of iodine, but however is a strong bactericide. The practical importance of these few facts concerning the antiseptic action of alcohol would be especially applicable in surface or skin disinfection at the seat of an operation or hypodermic injection, in cleaning hypodermic syringes and, in fact, under any condition where the organisms present would be in a more or less dry condition.

Stovaine and Adrenalin.—It appears to the writer that as a local anaesthetic stovaine possesses certain advantages over cocaine, which are worthy of consideration. Stovaine is a synthetic compound, the hydrochloride of an ester of benzoic acid, appearing as small white lustrous crystals, very freely soluble in water. Although stovaine is decomposed by alkalies and mer-

curic salts, yet, generally speaking, it is much more stable than cocaine, and its aqueous solutions may be sterilized by heat below 248 degrees F. It is less than one-half as toxic as cocaine and is equally powerful as an anaesthetic. Every veterinarian has noted the toxic effects of cocaine exhibited in the form of excite ment and restlessness in horses following the injection of a dram or upward of a 5 per cent. solution, or, in other words, these toxic effects may be noticed with as low as three grains subcuneously. Less than a 5 per cent. solution does not give the best of results injected locally, and it is often necessary to use two drams or more of the solution to satisfactorily inject the seat of operation. This would be equivalent to six grains of cocaine, and toxic effects are often observed with this amount. These toxic results are not observed with stovaine. Cocaine is a vaso constrictor, while stovaine is a vaso dilator, which point might also have its advantages. The extra hemorrhage or rapid absorption with resultant shortened local action, which might be experienced due to the vaso dilator effects of stovaine, may easily be controlled by the use of adrenalin chloride solution. If stovaine is used alone for skin anaesthesia it should be injected into the dermis and not subcutaneously. Stovaine is being used in preference to cocaine with great satisfaction in human practice for local and spinal or lumbar anaesthesia. We have been observing excellent results in our clinics at the hospital from the use of stovaine and adrenalin chloride solution as a local anaesthetic and hemostatic agent. From one to two drams of a 5 per cent. solution of stovaine in a 1-1000 or 1-2000 solution of adrenalin chloride give excellent results in minor operations in the larger animals, and 1 c.c. or so of the same for operations, such as trimming ears, etc., in dogs.

Yohimbine.—Yohimbine is an alkaloid obtained from the bark of the yohimbehe tree, and is probably one of the most powerful aphrodisiacs we possess. In human practice it has been employed with excellent results in pure forms of sexual impotence, but not in those due to constitutional organic disease or old age. Especially good results have been observed in sexual neurasthe-

nia and in impotency of neurasthenic origin. Following the use of the drug in animals, Muller states that the genital reflexes are rendered more acute, and that all the symptoms of sexual excitement are observed in both the male and female. Aside from stimulating sexual appetite, a marked vaso dilating effect is noticed throughout the body following the administration of yohimbine. As a result of this vaso dilation a marked congestion of the genital organs is noticed in both males and females. Authorities cannot quite agree as to whether the drug exerts a selective action on the genitals, or whether the congestion of the sexual organs is due to the general vaso dilating effect. According to a number of German investigators the drug causes a marked local congestion of the genital organs and thereby increases sexual desire. Male experimental animals following the administration of yohimbine showed erection of the penis and swelling of the testicles and epididymus. Females showed swelling of the horns of the uterus, hyperemia of the uterine mucous membrane, bloody discharge from the vagina and swelling of the vulva, together with other symptoms or signs of heat. The undesirable results following large doses were slight hemorrhages from the intestines and bladder. According to Holterbach the action of yohimbine per orem is unreliable and also expensive, and he recommends the subcutaneous injection in small doses. One injection he says is usually sufficient, as in 3 to 6 hours the animal in question shows full sexual desire, which lasts from 30 to 60 hours, and from which impregnation occurs in 90 per cent. of the cases.

Pfab, another investigator, cites the following interesting experience with yohimbine: Out of 79 cases treated for impotency and to produce heat he secured 62 positive results, or an average of about 78½ per cent. These animals consisted of two stallions, three bulls, one boar, eight mares, fifty-three cows and heifers, and twelve sows. For each of the larger animals he used one-half gram or seven and one-half grains of yohimbine hydrochloride dissolved in 200 c.c. of water, adding five minims of chloroform as a preservative. He administered one table-

spoonful three times daily. To the smaller animals he administered one-tenth gram or one and one-half grains in the same amount of water and in the same way. He also tried administering one decigram or one and one-half grains subcutaneously in the large animals, but discontinued, because the cows failed to react as readily as when given per orem. One mare developed colic twelve hours after injection and twenty-four hours later was in heat. Our own experience with bulls and stallions has been only with the subcutaneous method, with which we have had excellent results. In the case of boars we have observed good results both hypodermically and by administering the drug with the food. Yohimbine hydrochloride costs about $10 per gram, hence the cost of treating the larger animals per orem would be approximately $5 each and subcutaneously $1 each, the smaller animals approximately $1 each. Solutions of the salts of yohimbine deteriorate quite rapidly, hence should be freshly prepared and kept in brown bottles while using.

"LOUISIANA NEEDS MORE QUALIFIED VETERINARY SANITARIANS" is the caption of an article appearing in the Baton Rouge *Country Review* by "Sanitas," whom most of us know as one of our most prominent veterinarians and a past-president of the A. V. M. A. The reasons given for this need and the suggestions offered for its accomplishment are examples of the resourcefulness of the writer. The live stock interests are increasing, and more veterinary sanitarians are needed to protect them from disease; the laws are such that the stock owners are protected against "fraudulent fakers in the guise of veterinarians"; and, in order to get qualified veterinarians in country parishes where none are at present available, it is suggested that these parishes employ a veterinary sanitarian to look after its periodic outbreaks of contagious diseases, just as they have their health officer to look after the contagious diseases among the people, pay him a reasonable salary, and allow him his private practice to enable him to make up his income. It is believed his salary would be saved many times over, and that he would be one of the most valuable citizens in the community

FORT KEOGH REMOUNT DEPOT.*

By Veterinarian G. E. Griffin, Third Field Artillery.

The Fort Keogh Remount Depot is located between the Yellowstone and Tongue Rivers in the State of Montana, about three miles west of Miles City.

The reservation is ten miles square, well watered and drained, and its southern half is excellently sheltered from cold northern winds by a chain of tall bluffs. Its pastures abound in the nutritious and bone building "buffalo grass," which as a horse forage has no superior, and in addition to this valuable grass there is present a good supply of "blue stem" and "gramma."

This station has been in operation for about three years, and in that short period, under the able management of Captain H. P. Howard (Cavalry), it has done remarkable work in developing among the horse raisers of the territory tributary thereto an intense interest in the type of animal needed by the service.

From time immemorial the Northwest has been satisfied with the native "Cayuse" horse, which appears to have filled the needs of the stock raiser. Agricultural pursuits are more and more curtailing the area devoted to stock raising and as a consequence there has been a demand for a heavier type of animal to do the planting and harvesting of crops. To meet this demand, draft stallions of the Percheron, Clyde and Shire breeds were introduced and these animals crossed on the native mares with not altogether pleasing results.

It is true that a heavier type of horse has been produced, but he is devoid of symmetry and of clean, easy action; in fact, as a rule, he is something of a nondescript, heavy of head, short of neck, straight of shoulder, large of joint, wide of breast, small of barrel, weighty of croup, shaggy of leg, flat of hoof, and nasty

* Reprinted from *Journal of the U. S. Cavalry Association*, January, 1913.

in disposition, but nevertheless possessing good bone, wind and hardiness.

It must be admitted that the native horses were not much improved by the introduction of the draft sire. The cross was too violent to begin with, for it is a well known fact that among *horse breeders,* of whom there are many in the Northwest, violent blood crosses among horses are repugnant to nature.

It should be understood by the interested reader that these remarks on the draft cross apply to horse raisers, not horse breeders, horse breeding being a profession, horse raising a trade.

While horse conditions were at their worst in the Northwest, viewed from a purely military standpoint, the Fort Keogh Remount Depot was established, and not a moment too soon either. Had it been established ten years earlier the Northwest could now be depended upon to creditably horse the army in any emergency.

The first attempts of Captain Howard to furnish the service with mounts from this depot were, to say the least, discouraging. He had little that was even fair to choose from. The horse raisers did not know what the service needed and they were disappointed to discover that the best of the material on hand was barely suitable for army needs, and even this was purchased grudgingly on account of a start having to be made.

The horse raisers were unacquainted with the conformation of desirable military horses; therefore, it was a large part of the duty of the depot to educate and enlighten them along desired lines. This duty was up-hill work, but it has borne fruit and at present many of the ranch owners are breeding with the army in view as a market. For this purpose standard Hackney and Morgan sires have been secured and a few cases coach and thoroughbred. These sires have been crossed on selected mares with apparently good results so far as one may judge by the youngsters produced.

The strangest part of the cross with the drafters is that the second or third generation has produced many excellent artillery horses.

In conjunction with the difficulties encountered in procuring suitable military horses in the first two years of the depot's existence. Captain Howard had to contend with the prejudices of the service itself against Northwest horses with their disfiguring brands and notoriously bad dispositions.

Many of the older mounted officers had been educated in a school of good military equine conformation established by Missouri and Kentucky horses. This well known conformation has for many years been accepted, subconsciously no doubt, as a standard until now any minus deviation therefrom is looked upon with disapproval, contempt and even scorn. This is natural enough, too, but we, for the next two years at least, must become reconciled to a minus standard; for it should not be forgotten that the trolley car and the automobile have practically supplanted the light type of horse in those states on which the army has been in the habit of depending for its mounts. Even in the state of Missouri the draft animal is taking the place of the desirable combination horse so dear to the heart of every true cavalryman, and to such an extent that it is becoming more difficult each year to find a decent representative of the cavalry type of horse.

Had the Remount Depots not appeared when they did our horse problem would have been by this time a very serious one indeed.

Superficial observers of horse conditions frequently remark that there are more horses in the country now than there were at any other period since its settlement. This remark is undoubtedly true, and the price is higher too, but if the markets are searched and the class of horses considered, it will be found that eighty per cent. of the horses are of the draft type and that where we could find ten good cavalry horses five years ago, two cannot be found now.

It has been my own custom to purchase, train and develop a youngster each year. This year I have been unable to fine one at a reasonable price, and only two at an exorbitant one. It is not that my standard has become more exacting that I am unable to find a decent colt, but it is due to the fact that they are very scarce

and expensive even in the famous Platte County, Missouri. Such is the condition of the military horse market and such it will remain until the Remount Depots have convinced the people that it will pay them to raise a military type of horse.

There is considerable after-dinner horse talk now-a-days; some of it sentimental twaddle about the disappearing thoroughbred. The thoroughbred may disappear from the race course, where he was usually a weedy looking, short distance racing machine on which to foolishly bet money, but he will always remain here with credit to himself so long as decent, healthy men and women ride to hounds and demand speed, spirit, endurance, cleverness, weight and height in their mounts.

We do not need the thoroughbred horse in the ranks; as a cavalry horse he is undesirable mostly on account of temperament, conformation, inability to carry heavy weights for long periods, and an alarming loss of condition when exposed to the elements and skimped in his rations. He will do to cross with selected dams from which the cavalry conformation must come if it comes at all. Very little has been said of the "saddler" as a sire when breeding for the service is considered, nevertheless I venture the opinion that the true cavalry and light artillery horse will be produced from such a sire on carefully selected dams of good ancestry.

With all its discouragements the Fort Keogh Remount Depot is remarkably well organized and runs as smoothly as a well oiled machine in good order.

At this depot horses are first gentled by polite man-handling and then trained without the use of spurs and oaths. Cavalry horses are given a course of several months in the saddle, and artillery horses a less time in saddle and draft, before they are considered ready for distribution.

The methods of handling differ slightly at the different Remount Depots, but the general principle is the same. At Fort Keogh they have to use a "squeeze gate" to halter the new arrivals and draw a plan of the unsightly brands, which are now beginning to disappear entirely. It is believed that the "squeeze

gate" may be dispensed with in a year or two when the new crop of desirables with good reliable dispositions begins to arrive.

The cavalry horses now at that station are good. It is true they have not the style and class we have been accustomed to, but they are such an improvement over those of two years ago that our trust is in the depot and we believe our faith to be well founded.

The internal economy of this depot was something of an agreeable surprise; here was a small herd of sheep which furnished a carcass of mutton at least once a week; over there was a decent looking beef herd which supplied the American staff of life; yonder was a graded dairy herd furnishing an abundance of milk, cream and butter, while in a well sheltered swale was observed a large flock of white leghorns, carefully kept up to standard.

On the lowlands of the Yellowstone River were extensive fields of alfalfa, oats, corn, and some wheat, all of which were used to advantage in the feeding scheme. There was no haphazard farming indulged in at Fort Keogh; everything was done in a manner that indicated intelligent knowledge of the subject. A strict system of accounts is maintained and the profits from sheep, cattle, chickens and crops known exactly.

A special page could be devoted to the system of hog raising employed here. Suffice it to say that the animals composing this herd were first class in every respect and a source of considerable profit to the station. Perhaps it will be thought by some that the farm products are the perquisites of those connected with the station. Such is not the case. All profits are turned into the station fund and used for the running of the machine.

It is believed that this station will be self-supporting in a few years under management similar to that of the present.

We have it figured out for us at regular intervals that the price of a cavalry horse laid down at final station, under the remount system, is all the way from two hundred and fifteen to three hundred and fifty dollars. When all overhead expenses are

considered it is probably high, higher than what the animals would cost under the old system of purchase.

In any new extensive industry, where the original investment is large, the first few thousand articles manufactured would cost enormously if the investment were charged against them. It certainly is not a business method of fixing cost price early in the campaign; consequently those who are now crying against cost of production at Remount Depots must eliminate the original investment from their calculations for a few years more at least, until these depots are firmly established and have a decent opportunity to demonstrate their usefulness and economic value to the service.

It was not the writer's good fortune to see much of the commanding officer, Captain Howard, he having to depart on a purchasing expedition, but he had the good luck of becoming well acquainted with his assistant, Captain Archie Miller (Cavalry), who proved to be an energetic, painstaking, hard-working officer; a thorough horseman whose knowledge of the horse situation in the Northwest was surprising. This officer had every subject connected with the depot and its work tabulated in his brain in a wonderful manner. His whole heart seemed to be in his work and to such an extent that not a detail was overlooked. For the interest of Fort Keogh may the time be long until he is Manchued.

It might not be amiss at this point to say something about the proper time at which to make requisitions for young horses. All of us know that it has been the custom to call for remounts in the spring; at that season they were expensive and were beginning to shed their winter coats. On arrival at station the dealer's condition melted like snow in the sunshine; the coat dropped out in patches, and often with it the pen or pasture lice that had bred there during the winter. By May these young horses looked like "*the devil*"; nevertheless, out they went to be trained—save the mark—and hardened for the summer maneuvers, which killed a goodly number of this class of mount each year.

All remounts should be requisitioned for just after the sum-

mer's work. On arrival they should all be placed in one building, under the supervision of a sensible Fort Riley graduate and worked until the following spring under his direction. About April or May they may be turned over to the units to which they pertain.

Under a system similar to this there is little doubt but what remounts would give a good account of themselves during the summer.

The chances are that some one will remark: What are these Remount Stations for anyway if they cannot shape horses and put them in condition to be issued for immediate service? Are they not supposed to do the training?

It may be proper to reply that we do no expect Recruiting Depots to turn out finished and hardened soldiers, ready to take the field under all conditions on arrival at station; they need as much, and perhaps more, additional training and conditioning as the Remount Depot youngsters.

The New York State Breeders' Association meeting at Utica, January 22-23, presented a most excellent program, which was prepared for the purpose of presenting the claims of the various types of horses that can be profitably raised in the Empire State. Among the authorities who addressed the meeting were, Messrs. Forest Henry, Dover, Minn.; Francis M. Ware, Brookline, Mass.; Samuel Walter Laylor, New York, N. Y. (Editor *Rider and Driver*); Sidney S. Loman, New York, N. Y. (Editor *Trotter and Pacer*), and many others from Illinois, Iowa and Ontario, Canada; and our own Hollingworth, representing the veterinary profession, gave them some hard facts on some needed changes in the stallion registration law. This meeting was presided over by the Hon. Calvin J. Huson, Commissioner of Agriculture of the state, who is president of the organization.

Review Invaluable to the Young Practitioner.—An Iowa veterinarian, in renewing his subscription, writes: "I find the American Veterinary Review to be a very great help to me in many ways, and consider it *invaluable* to the young practitioner just starting out."

LEGISLATIVE TOPICS.*

By W. J. Martin, V.S., Kankakee, Ill.

As a member of your Legislative Committee I desire to call your attention to the existence of certain defective legislative enactments now in force in this state that concern your welfare both as citizens and professional men, and which it is your duty to have amended or repealed. The first and most important one that demands your immediate attention is the repeal of the anti-tuberculin law of 1910, which is still in force in this state. This law, in my opinion, is one of the most pernicious pieces of legislation that was ever placed upon the statute books of this state. It was conceived in ignorance and intolerant bigotry and passed by deceit and misrepresentation of well-known scientific facts that were self-evident to the whole civilized world, by a class of cheap politicians, working in the interests of a small class of milk producers and dealers, who wished to have a free hand in furnishing the people of this state with a grade of milk that might be obtained from any source they saw fit—either from diseased or healthy cows. The special sponsors of this law set up the plea that the tuberculin test was unreliable for an accurate detection of bovine tuberculosis; furthermore that it was injurious to the general health of the animals, upon which it was used.

It seems like a waste of time and energy in this day and age for any person or group of persons to combat the assertion that the tuberculin test is unreliable or injurious in its effects, when performed by a competent veterinarian. Yet such were the contentions of the members of the legislature in 1910 that passed this law. This assertion on their part has been the means of subjecting the people of this state to contempt and ridicule by nearly the whole civilized world. We saw this finely illus-

* Read before the thirtieth annual meeting of the Illinois State Veterinary Medical Association, at Chicago, December, 1912.

trated in this city one year ago, when the United States Live Stock Sanitary Association, at their annual convention in this city, passed a set of strong resolutions condemning the legislature of this state for placing such an infamous law upon the statute books. I wish to say to you, gentlemen, that it was the most humiliating experience that I have ever witnessed, when, as citizens of Illinois, we were compelled to sit and listen to the reading of those resolutions, without being able to say one word in defense of this commonwealth.

By the passage of this law the legislature of this state turned backward the hand upon the dial of scientific progress, whereon is written the medical investigations and discoveries of the past 25 years, pertaining to the prevention and eradication of human and animal tuberculosis—this foul and awful disease that bears that dread name, "The Great White Plague." And it is appropriately named, for about 200,000 human beings die annually from it in this country alone. It is estimated that of this number about 15 per cent. of these deaths were caused by the tubercle bacilli of bovine origin. Statistics show that of all the people who die in this country annually between the ages of 15 and 45, one-half of them die from tuberculosis. There is no disease in existence in this country that causes so much human misery and suffering as tuberculosis. It is common, world-wide knowledge among medical men and veterinarians, and even a large number of the general public, that drinking milk obtained from a tubercular cow will cause tuberculosis in the human subject; but you could not convince the members of the Illinois legislature of 1910 that such was the case, because they spent $10,000 of the taxpayers' money to prove the contrary, at least to their own satisfaction; and, what is more important, they tried to convince the people of this state to view the matter in the same light as themselves, by depriving them of the right and privilege to protect themselves from this important source of the disease—milk from diseased cows.

Now, let us pause for a moment and see who advocates the use of tuberculin as a reliable diagnostic agent for the detection

of bovine tuberculosis, also of its non-injuriousness to the animals, to which it is administered. First, the U. S. Government; secondly, the Canadian Government, together with the legislatures of some forty-two states in this country, who have passed laws requiring the use of tuberculin as a diagnostic agent. It is hardly necessary to state that nearly all civilized governments throughout the world recognize the value of this test. The legislature of Illinois is the only law-making body in the world (so far as I know) who has placed itself on record against this test, thereby casting odium upon the intelligence of the people of this state and subjecting them at the same time to humiliation and inconveniences in interstate live stock traffic with her sister states. But you cannot stop scientific progress by legislation; as well try to stop and sweep back from the shore the waves of the ocean at high tide.

If the members of our legislature who passed this law had devoted a few hours of their valuable time to reading some of the bulletins and reports issued by the United States Government on the nature and cause of human and animal tuberculosis, or the reports of the British Royal Commission on Human and Animal Tuberculosis, a commission that spent ten years in investigating tuberculosis and the tuberculin test, I believe they would never have placed this obnoxious law on the statute books of this state.

The opponents of the tuberculin test in this state make the assertion that in the pasteurization of milk from tuberculous cows we have an efficient method of preventing the spread of human tuberculosis. This is true only in part. Where this process is carefully performed it is true that a large number of the disease germs contained in the milk is destroyed. But, unfortunately, the method of pasteurization that is conducted in many milk producing establishments is nothing but a farce. The only way in which a disease can be cured is by removing the cause, and just as long as you have tubercular milk just so long will you have tubercular people, tubercular hogs, calves, poultry, etc.

During the past summer there was great excitement here in Chicago over the question of how to procure pure, healthy milk for the people. The great cry was and is, "Save the babies." We witnessed the spectacle of the mayor of this city hurrying here from his summer home among the shady dells of Wisconsin to preside over deliberations of a special session of the city council, called at the demand of the people to frame some kind of an ordinance, by which the milk supply of the city could be improved and to obtain clean, healthy milk. I thought it passing strange at the time that among all the speeches made and resolutions passed by the various individual and civic bodies not a single voice was raised (so far as I could learn) demanding the repeal of the very law that deprived them of the right to demand of all milk producers that every gallon of milk shipped into the city should be from cows that were known to be free from disease. The medical profession appears to me to be strangely silent upon this important subject, viz., the obtaining of milk for human consumption from cows that have passed the tuberculin test and are thus known to be free from the disease beyond the peradventure of a doubt. Whether this apathy on their part is due to lack of interest in the subject or fear of arousing some concealed opposition, I am unable to say. Suffice it to say that as a class the medical profession in this state has rendered us very little aid in the war against bovine tuberculosis, and if they are afraid to engage in the effort to have this law repealed, we should not be, because we are a body of progressive scientific men, interested in the health and welfare of the general public; and we will have the moral support not only of the majority of the people of this state, but of our professional brethren in this country and Canada as well.

With this object in view, I recommend that a resolution be passed by this association and signed by the president and secretary demanding the repeal of the anti-tuberculin law now in force in this state, and that a copy of the said resolution be mailed to the Governor and every member of the legislature in this state.

I would also recommend the passing of a resolution by this association asking for an amendment by the legislature of our present live stock sanitary laws, whereby the Board of Live Stock Commissioners be given ample authority to enforce proper sanitary rules and regulations regarding the importation of domestic animals into this state from adjoining states or foreign countries, that said animals be accompanied by proper certificates, showing that they have passed the tuberculin and mallein test, as the case may require. Also that the Board of Live Stock Commissioners' authority be amplified, so as to give them power to enforce quarantine and disinfection measures against any farm or other premises in this state where hog cholera or other contagious diseases of swine may exist.

The law pertaining to the contagious diseases of swine, that became effective July 1, 1895, does not, in our opinion, fully cover this subject, as no authority is given the Board of Live Stock Commissioners to enforce quarantine and disinfection measures against premises that may be affected with hog cholera. Millions of dollars are lost annually by the hog raisers of this state from cholera, and in our opinion they will continue to sustain this great loss annually, until a rigid system of quarantine, isolation of diseased animals, together with the thorough disinfection and cleaning up of the premises where the disease exists, and the enforced use of hog cholera serum. Such a system of hygienic measures is in force in Canada and has been highly successful, to a large extent, in reducing the ravages of hog cholera.

There is no reason why any person who is known to have hog cholera on his premises should be permitted to endanger all the hogs in his immediate vicinity by driving or hauling his cholera-exposed hogs to the public markets or elsewhere. Neither should he be permitted to allow his hogs, dead from cholera, to remain unburied for several days or until eaten by other hogs, dogs, crows, etc.; or that water courses may become polluted with the infection and be scattered over wide areas of country by flood waters.

It is a well-known fact among veterinarians that there is at least 50 per cent. of the hog owners of this state that are averse to taking even the most rudimentary measures to prevent the spread of hog cholera. Such people should be compelled by law to enforce sufficient sanitary measures to aid in eradicating hog cholera from their premises. Glanders has been practically eliminated from this state by a rigid system of quarantine, slaughter of the diseased animals and the thorough disinfection of the premises, and it is my opinion that we will never be free from the destructive ravages of hog cholera until like measures have been put into effect.

Tuberculosis is a common disease among hogs in this state. The percentage increases each year, and it will continue to increase just so long as the dairy-man with the tubercular herd of milch cows continues to feed the by-products of his diseased cows to his hogs. When these tubercular hogs are sold and shipped to markets that are under federal inspection, the animals of course will be detected and the meat condemned. But only about 50 per cent. of all the animals slaughtered for food in this country comes under federal inspection. The balance is slaughtered in private slaughtering establishments, over which there is no form of inspection. At least in the country districts. A few of the large cities in this state have meat inspectors.

Our present meat inspection law, passed and in force since July 1, 1907, is, in my opinion, wholly inadequate to cover this important subject. It should be repealed or amended so as to more fully cover the problem of giving the people of this state clean, healthy meats. We are still, I believe, a long way off in this country from the magnificent system of state or municipal slaughtering establishments that are so common in many parts of Europe, though the leaven of good example from these is at work in some parts of this country, a few cities and towns having established their own slaughtering establishments under the control of competent meat inspectors.

The Board of Live Stock Commissioners should be given a larger control over the country slaughter house. You all know

the conditions that prevail in and around these places. It always seemed to me an anomalous state of affairs for the federal meat inspection system to apply only to meats designed for interstate or foreign shipments, and leave the large majority of the people's meat supply without any sort of supervision, but the conscience of the country butcher, and you all know what an elastic organ that is. Every ounce of meat in this state, intended for human consumption, should bear the tag of inspection from the federal authorities or the Board of Live Stock Commissioners of this state. Then, and then only, will the public be enabled to procure clean, healthy meats.

Some News Notes on the Kansas City Meeting of the Missouri Valley Veterinary Medical Association.—During the luncheon served by the college to the visiting veterinarians at the noon hour Thursday, the college band boys did themselves proud in the rendition of several excellent numbers.

The visiting ladies were given a reception on Tuesday afternoon at the Coates House by the local ladies, and this innovation proved a most pleasing affair.

Tuesday night, while the association was in active session, the ladies had a theatre party at the Orpheum, and on Thursday the college ladies served the visiting ladies a luncheon in the college library, following which some fifty ladies spent an hour or more in attendance at the clinic. This is only another evidence that the wives of veterinarians generally are taking a live and personal interest in the progress of veterinary science.

All sessions of the meeting held the close attention of the members, showing clearly that veterinarians in that section of the country are determined to not only keep abreast of the times, but to have a part in the things that make for progress in the veterinary profession.

The association adopted resolutions to publish its proceedings in book form, so the doings of this association will hereafter be available for reference.

The makers and venders of surgical instruments and other supplies made a most extensive exhibit, and the display exceeded that of any previous meeting of the association, and the spirit of friendly rivalry elicited many favorable comments.

PURULENT INFECTION OF THE NAVEL IN THE NEW BORN.*

Dr. A. D. Glover, LaBelle, Mo.

Purulent Infection of the Navel is greatly favored by many of the circumstances attending the birth of the young animal, When it is born in surroundings of filth and dirt there is constant exposure of the newly made wound. The carnivorous and, to a lesser degree, the herbivorous mother, habitually cleanses the broken cord by licking, and thereby withdraws from it a large part of the Whartonian jelly, thus favoring the early desiccation of the stump. It appears, in spite of the fact that the mouth usually abounds in pathogenic bacteria, the process of licking the navel is, according to clinical observation, comparatively safe and tends to protect the parts against infection.

We observe infection most frequently in the foal, the mother of which animal pays less attention to the navel than most other domestic animals. Purulent infection of the navel often arises, also, as an indirect result of ligating the umbilical cord. The danger from ligating the cord lies usually in two principal elements, the infection of the wound by careless application of the ligature and the provision of a breeding ground for bacteria by the inclusion (retention) of the Whartonian jelly.

From a surgical standpoint nothing can be more dangerous to the new-born animal than the careless or filthy ligation of the umbilical cord. Most ligatures are applied by laymen without sterilization or even washing of hands or ligature. Even when the ligature is applied under some of the rules of modern surgery, other important ones are habitually neglected, and the ligature nevertheless wrongly and dangerously placed. The exterior of the cord consists of the impermeable amniotic sheath, which encloses within it the vessels surrounded by the Whartonian gelatin; if the

* Presented to the Missouri Valley Veterinary Association, at Kansas City, January, 1913.

cord is tightly ligated the gelatin is enclosed, and its fluid portion cannot readily escape to permit the proper desiccation of the stump. Even when the ligature is applied under aseptic conditions, if it retains the Whartonian jelly, the procedure is unsafe, as it furnishes a medium for pathogenic bacteria. The danger from infection is emphasized if the ligature is placed at a point too distant from the umbilicus, thus increasing the amount of tissue to undergo desiccation or putrefaction.

Another danger is the incarceration of the two umbilical arteries and the urachus. If the ligature is applied very tightly before the cord is severed the retraction of the urachus and arteries into the abdominal cavity may be prevented, leaving the open ends freely exposed to infection during the period of putrefaction of the tissues. When a living tissue is ligated and the ligature so tightly applied as to cause necrosis, it appears clinically to cause a prompt leucocytosis on the proximal side of the ligature which largely serves to prevent infection; but when applied to a dormant tissue, like the umbilical stump, no such reaction takes place, and the stump goes on to putrefaction or desiccation, as the circumstances may favor. If the cord is divided at the proper point the Whartonian gelatin pressed out thoroughly, and the stump ligated under perfectly aseptic precautions and kept in an aseptic condition (a very difficult process in the domestic animals), the operation is safe.

Navel infection occurs within a few hours after birth, and the symptoms usually follow very promptly, although in the initial stages of the disease they may be overlooked by the owner. The parts, instead of desiccating normally, become inflamed; there exudes from the center of the cord a dirty, thin, watery, flocculent serosity which may be grayish white or tinged with blood. It will generally be found possible to pass a small probe upward and forward for some distance toward the liver along the course of the umbilical vein. If the infection has been interrupted at the umbilical ring the probe will not pass beyond it.

The behavior of the case will depend upon the degree of extension of the infection. It is an important clinical fact that the

gravity of navel infection is usually in inversed proportion to the local disturbance; when the infection remains localized in the umbilicus itself, the parts become swollen, somewhat tender to the touch and soon suppurate. Small abscesses form in and about the umbilicus, which open and discharge pus, or a fistula may follow.

The swelling from local umbilical infection may be quite extensive; the course of such local infection is usually chronic, continuing for week after week. A somewhat limited amount of pus is discharged, which is generally of the ordinary consistency, and without odor. Such inflammation does not involve the general well-being of the young animal. It takes its food in the normal manner and amount, its digestion is undisturbed, it is playful and its growth is usually unaffected.

When the infection, instead of expanding its virulence upon the tissues of the umbilicus, gains admission to the open umbilical vein, and extends along its course toward the heart, and the bacteria and their products enter the blood stream, the symptoms are wholly different. The coagulated blood within the umbilical vein breaks up under bacterial invasion, liquefies, and may be partly discharged into the hepatic circulation from the central end of the umbilical vein, and externally from the stump of the cord, as a dirty, flocculent, reddish-gray liquid, consisting of the disintegrated blood clot mixed with the pus. The discharge may appear in three or four days after birth and may continue for two or three weeks or longer, should the animal survive. Soon after the commencement of suppuration in the umbilical vein there frequently occurs a corresponding infection in the broken end of the urachus, which results in the duct becoming reopened and a consequent dripping from the navel. Usually this condition is attributed to failure of the urachus to close, and while this condition may sometimes occur, it seems to cause no bad results if promptly treated, but I believe the leakage is generally secondary to the invasion of infection.

The symptoms of general infection vary widely in intensity, from the rapidly fatal cases, which only live a few hours, to

those which for a time do not attract any notice. In some of the mild cases no febrile symptoms occur of such a character as to attract the attention of the owner, and only when the secondary symptoms of infection arise is his attention called to the diseased condition of the patient.

The young animal may be left apparently well in the evening and is found the next morning severely lame in one of its limbs. Upon examination one of the prominent articulations is found swollen, hot and painful upon manipulation. The inflammation usually affects the more important articulations, especially the hock or stifle, and less frequently the elbow and carpus or other joints. The inflammatory condition may suddenly abate, while another articulation becomes involved. As the disease continues there is a well marked tendency for the arthritis to become fixed in a given articulation, and at the same time others become involved, until three or four are simultaneously diseased.

We recognize two distinct forms of arthritis, one a serous inflammation without the formation of abscesses, the other characterized by the presence of abscesses, the contents of which are often mixed with synovia. In the serous form, which is probably most common, the inflamed articulation is greatly enlarged, tense, hot and painful. The distended synovial sac may fluctuate, but does not point; later the articular tissues hypertrophy, the subcutis, synovial membrane and other parts thicken and become more or less sclerotic. At the same time the contents of the synovial sac may increase, causing severe distention, which may remain permanent.

When involving the femoro-patellar articulation, the synovial distention floats the patella upwards until it reaches the level of the top of the external femoral condyle, when the patella slips out laterally to constitute floating luxation of the patella, which may prove temporary or permanent.

Less frequently the arthritis is of the purulent character, and the joints soon become the seat of extensive suppuration, the pain is very severe and the constitutional symptoms are exceedingly marked. After the lapse of a few days the pus in the

synovial sac becomes so abundant that distinct fluctuation is present, the abscess soon ruptures if the animal survives, or if opened surgically, the young animal generally succumbs from septic poisoning.

The severe lameness caused by the arthritis exerts an important influence upon the course of the disease, aside from the septic condition. The lameness interferes with the animal taking proper nourishment, because in many cases it is unable to rise or stand while it sucks, and thus it suffers from starvation. In chronic cases it suffers greatly from decubitus gangrene upon various portions of the body, abscesses may also form in the lungs and, rupturing into the bronchial tubes, cause death from septic pneumonia.

The disease is the result of the entrance into the freshly broken cord of pyogenic micro-organisms, and so far as we are aware is not limited to any one form of infection, as in addition to the lesions mentioned there may occur tetanus, infectious diarrhoea, septic inflammation of the pleura, inter-muscular abscesses, ophthalmia, catarrhal enteritis, pneumonia, bronchitis, etc.

The prognosis is grave in all cases in which the infection has gained the general circulation. It is most hopeless in the foal, in which animal the mortality probably exceeds ninety-five per cent.

Therapeutic treatment consists in stimulants and alteratives, along with the injection of poly-valent bacterin every three to five days, but I do not believe the bacterin is of much value in the serous form.

Prophylactic treatment which is far more successful would consist in the use of some antiseptic, desiccating powder, and thorough cleanliness. Do not ligate the cord.

The powder should be dusted over the stump freely and repeatedly, until the remnant of a cord has become completely desiccated and hermetically sealed. Few diseases of animals are more subject to safe, convenient and economic prevention than navel infection of the new born. Its success calls for fidelity to cleanliness on the part of the owner, preceded by timely and intelligent advice by the veterinarian.

INTERSTATE LIVE STOCK INSPECTION.*

By T. T. Christian, D.V.S., Deputy State Veterinarian, Texarkana, Tex.

Interstate live stock inspection involves the inspection of all live stock being shipped, driven, or in any manner transported from one state to another, and must not be confused with the federal quarantine inspection for fever ticks, scabies, etc.

The primary causes for the enactment of state live stock sanitary laws which require and prescribe the inspection of all live stock coming into a state, is the insatiable desire of man to dispose of diseased animals in the most expedient manner available when he finds that he has such in his possession; and he can always find a dealer who is willing to buy this class of stock at the reduced figure, which they demand, and assure the owner that it will not become known in his immediate locality that he has knowingly disposed of diseased animals, and in this manner wilfully distributed an infectious disease from his own herd to that of his neighbors.

Also there is a large percentage of infection among live stock of which the owner and purchaser is entirely ignorant, such as the tuberculous cow and glanderous horse—which are the most dangerous of all and which cannot be apprehended without an honest test by a competent veterinarian. This being the major class which really demands interstate inspection.

In this manner infectious diseases have been distributed from one state to another, until it has become obviously a necessity that the states must pass laws requiring that all live stock coming within their borders should pass a rigid examination by competent veterinarians, so that in some measure the spread of the infection might be restricted.

The object of interstate live stock inspection is to restrict the

* Presented to the Missouri Valley Veterinary Association, at Kansas City, January, 1913.

distribution of infectious, contagious and communicable diseases and to prevent infection of uninfected areas, and in this manner to protect the health and wealth of the populace by shutting off from their food producing animals the source of infection, and to obviate the necessity for a state to expend vast sums of money in the eradication of a contagious disease after it has once become definitely established.

The legislative body of any state has the power to enact laws prescribing the regulations under which live stock shall enter their bounds. Also they have the power to put inspectors in the fields and vest in them what authority they may deem necessary to protect the health and wealth of their populace.

The methods to be employed in the inspection of live stock must be formulated to meet the demand of each peculiar locality. Where inspected in transit, such as at a point of entry into a state, the stock should be unloaded, fed, watered and allowed to rest before inspection.

The live stock yards at such points should be so equipped that animals being held for inspection could be amply protected from inclement weather, but where emigrant cars are handled that contain but few live stock, and those with ample room to lie down to rest, and on short hauls, it is often advisable to inspect in the car. This is not recommended however where the tuberculin or mallein test is given.

In giving the tuberculin test the cattle should be allowed a good rest, say from five to eight hours, before starting on initial temperatures, and we consider no test valid unless at least three initial temperatures distributed over a period of twelve hours, and four or five subsequent temperatures beginning not less than ten hours after time of injection of tuberculin and taken at two hour intervals, and if the temperature is seen to be rising at the expiration of this time, the animal should be held for at least two more temperatures.

Inspection of stock for transportation should be made on the day they are to be moved and not at some indefinite date prior to the time of movement.

In order to have and maintain a more efficient inspection service, all the states should endeavor to establish uniform regulations, among which should be included the adoption of a uniform health certificate on the back of which should be printed a list of the official inspectors and a digest of the sanitary live stock requirements of the issuing state. This certificate should me made in triplicate, the orignal to accompany live stock, the duplicate to be sent to the Live Stock Sanitary Board of the state of destination, the triplicate to be sent to the Live Stock Sanitary Board of the state of origin. A great many of the states have adopted the uniform health certificate already.

Also a more uniform scale of fees should be universally adopted. This has also been adopted by several states and has proven to be one of the most efficient manners in which to eliminate the all too frequent claim of graft and overcharges. Local conditions however should govern, in a great measure, the charge, as what might be considered a reasonable fee at one point would not be applicable at another.

An inspector should not be expected to make a trip where it takes a day's time away from his local business, and additional expenses, for the same fee that he would do the work at his local point.

A great many complaints arise in regard to overcharges, but I am pleased to say that the bulk of these when ferreted out cannot be substantiated. It is my opinion that the scale authorized by the Live Stock Sanitary Commission of Texas, which is also used by some other states, is the most satisfactory that can be adopted and is as follows:

At home—Tuberculin and mallein test: One head, $5.00; for the next five head, $3.00 per head, etc. Physical examination: For first three head and under, $3.00; for over three head and up to one carload, $5.00; for each additional car, $2.50 per car.

Abroad—Tuberculin and mallein test, $10.00 per day and expenses for ten head or under; over ten head, $1.50 for each additional animal. Physical examination—The same as at home with mileage.

This scale of fees has proven adequate compensation for the veterinarians' services, and satisfactory to the majority of shippers.

The scope of inspection should be widened to cover strangles, influenza, and all so-called shipping fevers. At present very few of the states pay the slightest heed to this class of diseases. It appears that they have come to look upon it as a necessary evil. In fact Alabama is the only state that I know of which absolutely prohibits the importation of stock with these diseases.

More stringent legislation along this line would bring about some remarkable cleanups and changes in the horse and mule markets in this country, and would save shippers a vast sum of money each season.

There is no field of work which presents more opportunities for dishonest service than that of live stock inspection. Nine shippers out of ten will make an effort to secure a certificate without an actual inspection. They will advance arguments in regard to their knowledge of the stock they are handling and point out the fact that they never talk, and that they want to be released as quickly as possbile. Very few of them submit willingly to the tuberculin and mallein tests, and it is a deplorable fact that some veterinarians seem to prefer to make out a temperature chart in their office to going into the pens and doing the actual work.

An inspector who is wont to continue such practices should be punished by having his commission annulled and his name published so that such practices might be forever discouraged.

Every inspector at a point of entry to a state is often confronted with the proposition of the disposition of animals condemned en route. In many instances, as has been the case with the writer, this stock is in a state other than the state of origin, and which prohibits the entry of uninspected animals, yet without the state of destination, and in complying with the requirements of one state you indirectly violate those of another. This is a point I would like to hear thoroughly discussed.

The results obtained from sanitary live stock requirements are of two clasess, the first of a psychologic nature, which prevents the shipment of animals known to be infected.

The second is the apprehending and condemning of attempted shipments of diseased animals, both of those known by the shipper to be infected, and those of which he is ignorant.

The common result is the prevention of the distribution of infectious, contagious and communicable diseases from infected areas to uninfected areas.

The two states which, from my observation, are doing the most toward live stock sanitation are Alabama and Montana, and it is evident that their state veterinarians, Doctors Carey and Knowles, are in a great measure responsible for their efficient requirements.

I am free to acknowledge that in the past Texas has been somewhat backward, along the points noted, but it affords great pleasure to call attention to the fact that within the past two years great changes have been wrought and that she is now striving to maintain an efficient safeguard to her live stock industry by placing veterinary inspectors at each point of entry, and at various points throughout the state.

These changes have been brought about by our present administration. We are indeed fortunate in having as governor His Excellency, O. B. Colquitt, who is a staunch friend to the stock man and veterinarian. He has indeed shown excellent judgment in his appointment of a Live Stock Sanitary Board, the chairman of which, the Honorable W. N. Waddell, of Ft. Worth, Texas, stands eminently fitted as a live stock sanitarian, but the man at the helm who has made our present achievements possible and to whom we are looking for future developments, is our State Veterinarian, Dr. E. R. Forbes, whose extensive experience in the field of veterinary science amply qualifies him for the trying duties of his present office.

ENGAGED: Dr. S. J. Alcalay, Cottonwood, Minnesota, announces his engagement to Miss Julia Rubin, of Chicago. We voice the sentiment of all their friends when we congratulate the happy couple on this their first official step leading to the matrimonial state.

LAND MARKS OF PROGRESS.*

By W. J. Martin, V.S., Kankakee, Ill.

As one of the oldest members of this association it gives me great pleasure in having the honor of addressing you to-day and at the same time to extend a cordial welcome to you all on this the 30th anniversary of this association. I can assure you that it affords me sincere gratification to see before me the familiar faces of so many of the older members—men who have so heroically borne the many burdens of this association in the early days of its struggle for existence; men who have so often experienced the bitter pangs of its defeats, as well as the joys of its victories. These men have indeed been loyal, brave and true to the association and to their profession, and their example may be safely emulated by those who come after them.

When I look over this large assembly of professional men gathered together here from nearly all parts of the country, my mind cannot but revert backwards over the long vista of years that have passed, to the time when a small group of earnest men, imbued with the highest ideals of their profession, met in this city thirty years ago and laid the foundation of this association. A few of these pioneers, I am happy to say, are still with us, and they are just as full of youthful enthusiasm and professional zeal as they were thirty years ago. We all sincerely hope that their days will be long in the land of the living. Others, less fortunate, have joined the silent majority—full of years and honors. Let us pause a moment and drop a wreath on their graves and cherish their memories, ever green in our hearts, while we murmur: "Well done, thou good and faithful servants."

* Presented to the thirtieth annual meeting of the Illinois State Veterinary Medical Association, at Chicago, December, 1912.

"They're passing away, these dear old friends,
Like a leaf on the current cast;
With never a break in the rapid flow,
We watch them as one by one they go
Into the beautiful past."

From the annals of this association for the past thirty years we are able to obtain a fairly accurate record of the progress that has been made by our profession in this country up to the present time. That this progress has been rapid, as well as brilliant, none will deny, but this progress of the past thirty years is but the precursor of a still more rapid and brilliant advance to be made by our profession during the next thirty years.

Progress has always been a prime incentive in human nature, ever since man first made his appearance on this earth. The prehistoric cave-man, originally endowed by nature with the most primitive means of defense and offense—viz., teeth, hands and a rude club of wood or stone, wherewith to procure food and defend himself against the attacks of savage beasts and his even more savage fellow beings—found himself seriously handicapped in the struggle for existence, made an important step forward in progress when he discovered that by chipping a piece of flint to a sharp point and fastening that point into the end of his club he had a much more efficient weapon, viz., a spear. Again, when he discovered the principle of the bow and arrow he had made still greater progress, because this weapon enabled him to kill or disable his enemies without coming into personal contact with them. And so it has been from that early age forward. Every important discovery made by man in the arts and sciences has been a step upward and onward in the evolution of the human race. Evolution, now a recognized science, is but another name for progress.

All animate and inanimate nature obeys that primordial law which is a tendency of matter to advance from the simple to the complex; and veterinary science is no exception to the rule. When we see revolution, peaceful or otherwise, shaking the

foundations of governments, overturning the long-existing order of established customs and usages, that is progress, though some of our ultra-conservative fellow beings would fain make us believe it to be chaos.

The science and art of human and animal medicine has advanced since its first inception, as a rule, slowly; at other times with such great rapidity as to form an epoch or new age. A few only of these can be mentioned here; viz., ligation of blood vessels, by Ambrose Pare; the discovery of the circulation of the blood, by Harvey; vaccination, by Jenner; chloroform, by Guthrie; fermentation and bacteriology, by Pasteur; antiseptic surgery, by Lister; and at the present time we stand on the threshold of a new era or epoch in medicine, viz., sero-therapeutics.

The humblest worker in the field of human endeavor or achievement, be his condition or environment what it may, is often an important factor in making for human progress. Some of the greatest discoveries in the evolution of mankind have quite often been made by men who worked the greater part of their lives in some obscure walk in life.

The race is not by any means always won by the great or strong. Neither are all the important inventions or discoveries made in the halls of great schools or universities, or by those working under the auspices of powerful nations, but more often by the patient worker, faithfullly performing his allotted tasks in the field of every-day life. This holds true in our profession as in every other important occupation of mankind.

Thus we see, in order to be successful in our chosen calling, we should devote as much of our time as possible to study, observation and clinical investigation, and record our experiences for the benefit of our present-day fellow workers, or for those who may come after us.

In this day and age we are passing through a rapid cycle of change. New methods of preventing as well as curing diseases of men and animals are constantly being brought forward. Some of these systems will become permanent weapons in our

armamentarium against disease. Others will be found to be defective and will quickly disappear, never to be heard of again. In order to be able to intelligently discriminate among this vast amount of material, we must keep ourselves by study abreast of the times; in fact, we must progress, because if we do not, we will quickly find ourselves cast upon the scrap heap of incompetency.

Glanders Conference in New York.—Hon. Calvin J. Huson, Commissioner of Agriculture of the State of New York, called a conference on glanders at the office of the second Assistant Commissioner in New York City, on January 17. Twenty veterinarians were in attendance, also representatives from two of the leading horse marts. The first side of the question attacked was the *causes* of the prevalence of glanders, especially in Greater New York. Some of the causes cited were the large number of horses in our streets, the crowded conditions of our stables, their unsanitary condition, public watering troughs, the indiscriminate use of glanders vaccine, and the tendency to unlawfully dispose of reactors, thereby disseminating the infecting centers. Some of the obvious *remedies* offered were the licensing of buildings used for stables, and only issuing licenses to those reaching a satisfactory standard of sanitation, systematic inspection to keep them up to that standard, the same inspection to apply to the horses housed therein, the abolition or regulation of the use of the watering trough and the restriction of the use of glanders vaccine to horses that have been shown to be free from glanders infection by the blood tests.

Another point raised as being objectionable and possibly tending to the dissemination of the disease is the delay caused by waiting for the order to destroy the animals from Albany. A remedy to this was offered in having some one in the city with power to act for the Commissioner in that capacity, to which the Commissioner cheerfully acquiesced. In fact, Commissioner Huson, by word and act, throughout the entire conference, gave evidence of the fact that he was looking for remedies to overcome this great menace to the horse population of the state, and looking mighty hard; and we hope that he got enough suggestions to aid him in amending the agricultural law, so as to be in a better position to cope with the situation.

REPORTS OF CASES.

SOME CASES ILLUSTRATING THE USES OF ARECOLINE IN ACUTE PLEURISY AND SOME OTHER TROUBLES.*

By D. D. LeFevre, D.V.M., Newark, N. Y.

Year after year we come together for the purpose of relating our experience, good or bad, so as to assist each other, and in order that we may profit one by the other's experience. It is only a short while ago, about two years I believe, that to me there was one particular trouble that I dreaded to come in contact with, namely, acute pleurisy in the horse. Well do I remember some of my cases. In the early stage they were a regular nightmare of hot applications, counter irritation and dosing with various drugs, only to be followed a little later by hydrothorax and the tedious job of tapping and drawing off of from thirty to forty quarts of water every two or three days, and next a dead horse and dissatisfied client. But it is all past now like a bad dream, and at the present time a case of acute pleurisy is approached with the same degree of certainty as a case of parturient pareces or laminitis. In fact, it is just a race or a game to scare the owner all you can; to get there just as often as you can so as to get as large a bill as you can before the patient gets well, because he certainly will get well, and no dropsy follow. And all of this comes from a little mistaken diagnosis made now going on two years ago. April 28, 1911, I was called to Harry Ford's, arrived just about dusk, and being in a great hurry to make another call did not examine patient thoroughly, though I did write down on the window casing a record of his temperature, pulse and respiration. Patient was not taken out of his rather dark stall, but it was observed in backing him up a little that he was rather stiff and sore. It was hard to get him to move. Temperature, 105; pulse, 80; respiration, 22; and the pulse was difficult to count, one of those kind where you get a couple of "struck wire" ones, then you don't get it for three or four beats, then a couple of strong ones again. Books don't describe it, they say a struck wire pulse;

* Read before the New York State Veterinary Medical Society, July, 1912.

that is part right and a bigger part wrong. In my cases of pleurisy though that I am telling you about, those that finally died (usually in the acute stage, if my memory serves me right), I had to count the pulse by osculation of the heart if I got it at all correct. I suppose you all know what kind of a pulse this was now since the diagnosis is made, but at that time I did not sense the meaning of that pulse, and just took the case to be one of founder and hurriedly gave one-half grain of arecoline and about ten minutes later another half grain; left some non-important medicine and hurried on to the next case.

Returning the next morning, April 29, and starting to back patient out of the stall he gave a distinct pleurisy grunt, and then I began to sit up and take notice that the doctor had blundered on a diagnosis, and, upon careful examination, it was found that there was absolutely no laminitis, but a very severe case of acute pleurisy. Animal was so sore through chest that he could hardly move. Temperature, 103½; pulse, 52, and respiration, 28. Notice the drop in temperature from 105 to 103½ and the drop in pulse beat from 80 to 52. I reasoned that as one dose of arecoline had not killed him perhaps another would not, and, as he had made such a big improvement, I would just chance another dose anyway, and so gave one-half grain arecoline, and in ten minutes another half grain, and in a few minutes animal began to slobber, seemed relieved of his suffering, breathed more easily, was not so stiff, moved around of his own accord; he soon laid down and apparently seemed to be comfortable on a good bed of straw in a box stall that was provided. I always give box stall, believing that it is important for the patient to secure this great but temporary amount of rest and comfort that is afforded by the peculiar action of arecoline. Next day owner told me that patient remained down nearly two hours and appeared to be quite comfortable. On that day, April 30, temperature, 102½; respiration, 15; pulse, 46. I repeated the arecoline, and again the patient laid down and appeared to take some comfort. May 1, temperature, 100.8; pulse, 36; respiration, 22. Same treatment repeated followed by same results. May 2, temperature, 101; pulse, 34; respiration, 15. Left a little nux and digitalis and discharged patient as cured, but saw him occasionally afterwards to ascertain if any dropsy occurred, and there did not.

My next case was at Christopher Stingle's. Called at ten o'clock at night, May 11. Animal had ploughed in the forenoon, but in the afternoon was found to be sick, and that night I was summoned, and found a bad case of plain acute pleurisy; tempera-

ture, 104; pulse, 70; respiration, 40. Treatment and results a repetition of the former case. May 12, temperature, 104; pulse, 68; respiration, 36. May 13, temperature, 100.5; pulse, 58; respiration, 18. Discharged as cured, and no dropsy followed. And so I might go on and mention a number of cases that I have tried this on and had the same results. But now mind you I am not saying that it cures all cases of pleurisy. I believe the drug is absolutely worthless in a case that has become at all chronic, say past two days old at the most; but since I have been using it I have not had a single case develop hydrothorax where the arecoline was used in the acute stages, say during the first twelve or twenty-four hours. And it is the same with laminitis. They all seemed to be aborted in from four to five days. Arecoline is no good if the disease has become at all chronic. My results have not been so favorable when there has been a complication of distemper, but I do believe that the drug is the most valuable one that we have in the treatment of plain acute pleurisy. I have tried it in acute pneumonia and have never seen it do any harm, and believe it gave valuable aid and cut short the acute inflammatory stage. Of course absorption had to take place slowly. I have used it in several cases of sunstroke with apparent brilliant results. The first case was a large black mare, found her lying in the road panting and struggling, gasping for breath; gave one-half grain of arecoline; five minutes later another half grain; and in twenty minutes the animal lay quietly on her breast, slobbering and nibbling at grass. In about one hour patient was up and eating grass, apparently well. A report of other cases would only be a repetition of the same story.

In blind staggers I have had only one case to try it on. This horse had been driven forty miles the day before, fed mouldy hay at night, and when I saw him the next day four men were trying to keep him in the stall. He was blind as a bat, ramming in first one side of the stall and then the other, falling down and getting up, muscles twitching and jerking, respiration stertorous; could hear him a block away. Giving medicine orally was out of the question, but I did give several half-grain doses of arecoline pretty close together. Patient now quieted down and at the end of two hours was standing quietly and appeared to be much improved. I was anxious to see elimination of the bowel content, so gave one grain of eserine, and in a few minutes all of the violent symptoms returned, muscles twitching and jerking, patient struggling and plunging around, shortly fell to the floor and died. I am now anxious for another case to give arecoline another trial,

as patient showed marked improvement while under its action. I would say that in colic, laminitis, acute pleurisy and sunstroke arecoline is my main drug, and that it is a valuable drug in acute pneumonia. I also believe that we will find it a great helper in aborting any acute inflammatory disease.

IMPACTION OF THE SINGLE COLON.

By Edgar Heiny, V.M.D., Hattiesburg, Miss.

The subject, a 9-year-old gelding, was brought to me for treatment about 10 a. m., showing alternate colicky pains.

Symptoms: 10 a. m., pulse 60, full and bounding; temperature 102° F.; mucous membrane slightly injected; breathing accelerated and heavy, sweating; would lie down flat on side and lay quiet for a short time, roll a little, get up, stand a few minutes and repeat the performance. No flatulence and very slight peristalsis.

Treatment: Gave aloetic physic ball and also gave ½ gr. of eserine and 1 gr. pilocarpine hypodermically.

10.30 a. m.: Patient much more uneasy due to eserine and pilocarpine; passed a little flatus; repeated the eserine and gave ½ gr. of arecoline and ½ gr. of strychnine. Gave rectal injection of several gallons of warm water and soap, rectum empty, forcible straining on introducing arm into rectum.

11.30 a. m.: Patient much easier, drank a little water and nibbled at hay, would still lie down on side most of the time, but did not roll. Pulse had dropped to 50 and not so full and bounding; breathing still labored; mucous membrane about the same; temperature same.

2.30 p. m.: Patient about the same as at 11.30. Gave 2 ounces carbonate ammonia and 1 ounce powdered nux vomica in ball (Reeks). Gave rectal injections warm water and soap, several gallons, which was at once thrown off as before.

4.30 p. m.: Patient more uneasy again; breathing more accelerated; sweating; pulse 70 and full; getting up and down and rolling. Urinated; urine of high color. Gave 1 ounce of chloral and hypodermic injection, arecoline ½ gr. and eserine ½ gr. Gave rectal injection, warm water and soap. Peristalsis good.

5.30 p. m.: Patient much easier. Lying down most of time.

8 p. m.: Patient restless again. Pulse 60; breathing accelerated; temperature 102; mucous membrane about the same as

at first; peristalsis good. Gave more rectal injections. Gave 2 ounces turpentine and 2 ounces spr. nitr. ether in a quart of linseed oil as drench.

12 m.: Patient easy lying down on side; pulse 50 and strong; mucous membrane about same; breathing heavy. Patient drank considerable water. Peristalsis good. Temperature 101.

3.30 a. m.: Patient uneasy, getting up and down; rolling, sweating; breathing accelerated again; pulse 50 and strong; temperature 101. Gave 1 ounce chloral; hypodermic injection a. ecoline ½ gr. Rectal injections which were immediately thrown off. Urinated; drank a little water.

6.30 a. m.: Patient easy and standing; pulse 50 and mucous membrane slightly more injected and slightly icteric. Temperature 102; peristalsis good; breathing good. Gave rectal injection, part of which was retained some time.

January 12, 8.30 a. m.: Patient still easy, lying down on side. Symptoms about same as at 6.30.

10 a. m.: Patient rolling a little at times. All symptoms about same. Gave 2 ounces carbonated ammonia and 1 ounce powdered nux vomica in ball. Rectal injection was thrown off again and much straining on introducing arm into rectum.

1.30 p. m.: Patient about same as at 10 a. m., except lying down most of the time quietly.

5 p. m.: Patient a little uneasy at times, otherwise symptoms about same as at 1.30. Gave ½ gr. arecoline and ½ gr. strychnine. Rectal injections were thrown off again; patient urinated.

10.30 p. m.: Patient about same as at 5 p. m. Gave another ball of carbonated ammonia 2 ounces and powdered nux 1 ounce.

January 13, 8.30 a. m.: Patient much improved; seemed better all day; gave one quart linseed oil; rectal injections which were not retained. Patient drank several buckets of water during the day. Gave same treatment as day before.

Tuesday, 14, 8 a. m.: Patient a little uneasy again; pulse 70, but still strong; breathing labored; temperature 102.5; mucous membrane about same as day before. Gave carbonated ammonia and nux ball.

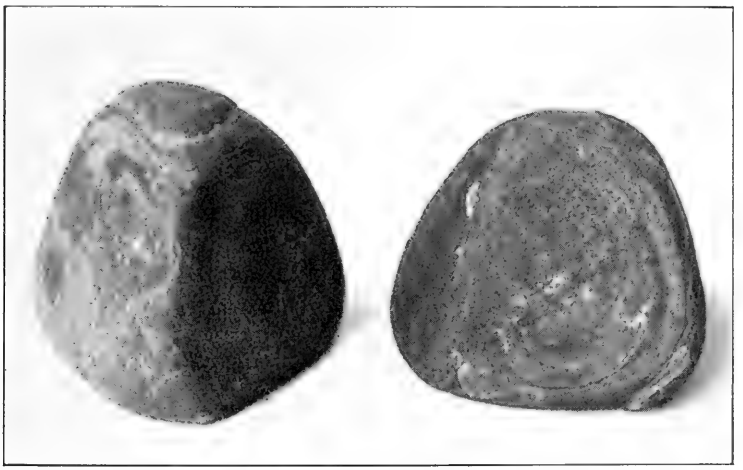
12 m.: Patient same as at 8 a. m. Drank a bucket of water. Lying down most of time; rolled a little at intervals. Gave rectal injections which were immediately thrown off; pulse about 70 and strong and regular; temperature 102.5; mucous membrane slightly more injected.

4.30 p. m.: Patient a little more uneasy; pulse 80, but still full and strong; breathing faster and labored; temperature 104.2.

Gave 1 gr. arecoline and ½ gr. strychnine. This produced a very distressing condition to patient. There was extreme salivation and attempts at vomition, and patient did emit quite a little sour smelling frothy material from nostrils at these attempts; sweating and nervous trembling. Did not lie down and roll. After the effects of the arecoline passed off, patient drank a bucket of water and seemed easier and brighter for two hours.

8 p. m.: Patient lying down; rolling a little at intervals; pulse 72, but still strong, although not so full, seemed smaller but regular; temperature 105; breathing very labored, and patient seemed much distressed. Patient died at 10 p. m.

Wednesday, 11.30 a. m.: Held post mortem. Carcass had scarcely swollen at all and was not very stiff. On opening abdomen there was—no doubt formed after death—quite a little straw-colored fluid in cavity from slight peritonitis. There was very slight inflammation of intestines. All other organs normal. On examining single colon, came across two hard objects, about midway of colon. On opening up colon I took out two triangular-shaped calculi. One has a perfect triangular base and three triangular sides and weighs 1¾ pounds. The other has a rectangular base and four triangular sides like a pyramid, and weighs 2¼ pounds.



History: This horse was 9 years old, weighing 1,200 pounds, was shipped to Meridian from Fort Worth, Texas, and sold to the Meridian Fire Department and had been in their service 3½

years. Had never been affected with colic up to this time. He had been off his feed and had a depraved appetite for about two months; would eat dirt and wood, and would paw the plastering off an old wall and eat it. His bowels had been irregular for about two weeks, and an attendant told me he had had only two small actions the day and night before he was brought to me for treatment.

TWO CASES OF METRO-PERITONITIS IN THE BITCH.

By Robert W. Ellis, New York, N. Y.

Two cases presenting practically identical symptoms and reaching fatal terminations in about the same length of time, having recently occurred in my practice within five days of each other and died within three days of each other, I report them for any benefit a brother practitioner may derive from them.

Case 1.—A female pug dog, ten years old, had never been bred. Had terminated a rutting period about two weeks prior to the development of the symptoms that caused the little animal to be brought in for treatment. The most noticeable symptom, and the one which alarmed her mistress most, was a profuse flow of blood from the generative apparatus. There were, in addition to this, distention of the abdomen and great tenderness evinced when the slightest pressure was applied, especially over region of the uterine horns; temperature 103 2/5, respirations hurried, appetite impaired and occasional vomiting. *Diagnosis:* Inflammation of the uterus and uterine horns. *Treatment:* A heavy coat of antiphlogistine applied hot over the surface of the abdomen, covered with absorbent cotton and bandaged, and internally ½ grain of ergotin at three-hour intervals. Two days later found patient much improved in spirit, apparently not in pain, eating a little, but still flowing. At this visit gave hot douche per vagina, with one chinosol tablet to two quarts of water. A considerable amount of blood in various stages accompanied the return flow from the vagina, and the little animal seemed to suffer great pain during the douching. Antiphlogistine and ergotin continued. On returning to the case the following day, the owner reported a great decrease in the flow of blood, and the dog seemed much improved. The hot chinosol douche was repeated, and this time the return flow of water was

scarcely changed—just a slight coloring in the first few jets of it; but the patient seemed to suffer pain while giving it. On visiting the patient the following day, my clients happily informed me that the haemorrhage had been entirely controlled, and that the little dog seemed much better, but at times vomited after eating. They seemed to feel that that was the only abnormal symptom present, and felt very hopeful of a speedy recovery. That symptom was prescribed for, and the patient was not seen again until the third day thereafter, when I was called because of a return of the pain. I found the little animal panting and evidently in great distress; ordered renewal of hot applications; prescribed anodynes, and gave a grave prognosis. In less than seven hours from that time my patient was dead, having seemed to respond to the treatment up to the last hour, when she became suddenly worse and collapsed. *Post mortem:* What the post mortem revealed, made me wonder how it had been possible for the little animal to live as long as it had, cheerfully wag its tail when spoken to in a kind voice, and to apparently improve for a few days. On making an incision into the abdominal cavity a reddish muco-purulent discharge flowed copiously from the opening; after this had subsided, the opening was enlarged and the digestive organs removed *en masse* (leaving the generative organs intact) and examined from end to end carefully upon the table, and nothing unusual was noted. The generative organs were then detached and placed upon the table for examination. The uterus and cornuae presented the appearance of pregnancy; their general calibre was enlarged, and at regular intervals dilated, so as to give the appearance of containing foetuses; but upon manipulation were easily compressible, and on being opened were found to be filled with the same muco-purulent fluid that had flowed from the abdominal cavity on opening it. The entire mucous membrane lining the uterus and horns, and the peritoneum enveloping those organs, was literally "eaten up" with the inflammatory process that had been responsible for the symptoms presented.

Case 2 was a female Maltese terrier, nine years old, had never been bred, and presented *all the symptoms* of case 1, except that there was a nasty discharge from the vulva instead of the flow of blood when the case was presented. Vaginal douches were ordered, but were not given (the owner not being in a position to carry out that part of the treatment); course and termination the same as former case. No opportunity for post mortem was afforded in this case.

EARLY DEVELOPMENT OF ASCITES.

By the Same.

A small female bull pup, four weeks old, was brought to the office, presenting a very peculiar spectacle. This little animal weighing approximately not more than three pounds, had its abdomen distended to such an extent as to give it a grotesque appearance. Laid upon its back, it resembled more than anything else a fat frog. A small trocar being introduced, sixteen ounces of fluid was drawn off. The weight of the fluid withdrawn, representing one-third of the approximated weight of the pup. The pup was not returned for treatment, and the outcome is not known.

GORE FROM A COW—IN A MARE.*

By Chester L. Blakely, M.D.V., Augusta, Me.

The subject was an eight-year-old mare, small, and worth about $125, and was hooked by a cow in the groin on the median line very close to mammary glands. The owner telephoned me that two or three feet of her intestines were hanging out, and would not listen to anything but that I should go to his place as soon as possible. I instructed him to tie the mare so she could not lie down, and to get a clean sheet, soak in hot water that had been boiled, and wrap it around her securely to keep the intestines warm and free from dirt, and I arrived at his farm about two hours after accident had occurred. I gave a large size tablet of H. M. C. containing 2½ grains of morphine, and as soon as we could get help I cast the mare and removed the sheet. On washing bowels off I found them free from injury and very little discolored. The bowel had escaped through a hole 3 or 4 inches long and formed a sac half the size of my head between skin and muscular tissues, and 2 to 3 feet protruded. I enlarged both the outside hole through the skin and inside through the muscle and peritoneum, and replaced the bowel as carefully as possible. I then sewed muscle and peritoneum with heavy silk suture (on account of lack of confidence in my supply of catgut), and left long ends outside of the knots. I then packed the sac between muscles and the skin with carbolated gauze and stitched the skin securely, leaving small end of gauze exposed and hanging out slightly.

* Presented to the Maine Veterinary Medical Association, Augusta, January, 1913.

We then allowed the mare to rise, and I advised him to keep her up for twenty-four hours or more, and feed soft feed, and to watch very carefully. On the third day I again visited the mare and found her apparently as well as she ever was. I removed the gauze and washed with solution of lysol, using fountain syringe, peroxide, carbolated gauze, etc. I left the fountain syringe, lysol, solution and peroxide and instructed the owner to dress it again on the second day and thereafter every day. Several of the silk sutures sloughed away after first week, and in two to three weeks the wound healed as clean and smooth as it possibly could. I saw the mare for the third time on about the fourteenth day and found her free from fever or any signs of infection. The case terminated very satisfactorily, recovery being rapid and complete.

UNDER RESTRICTIONS: In view of the fact that at the December meeting of the United States Live Stock Sanitary Association the impression was received by many members that there were no restrictions on the application of the tuberculin test by laymen in Wisconsin, the following reply to an inquiry by Secretary Ferguson, which is self-explanatory, is here reproduced:

"Dear Sir: I acknowledge herewith receipt of your letter of December 19, 1912. In reply will say that a Wisconsin state law allows laymen to administer the tuberculin test under certain restrictions after passing an examination given by the Live Stock Sanitary Board. Permits for such testing are issued subject to revocation at any time by said board. In no case are tests made by laymen approved for interstate shipment by the State Veterinarian of Wisconsin, nor have they ever been. The matter of approving certificates of health for interstate shipments is wholly in the hands of the State Veterinarian.

"Very truly yours,

(Sgd.) "GEO. WYLIE,

"President, Wisconsin Live Stock Sanitary Board."

WELCOMED IN THE PHILIPPINES.—A subscriber in the far-off Philippines says, in renewing his subscription: "The benefits gained by a careful perusal and study of contents of the REVIEW are too numerous to mention; and the monthly receipt of each copy is looked forward to with supreme anticipation."

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

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

Rupture of the Diaphragm [*A. T. M.*].—A six-year-old gelding, while crossing a railroad track, had the right hind shoe jammed in the flange of the rail and so tightly fixed that he could not withdraw it. He threw himself down, and when his foot got loose he got up very lame. He had a bad contusion of the left shoulder and partial rupture of the muscles of the right hip. He was put in slings and placed under treatment. Two days after he was quite paralyzed on the shoulder but improved behind. A day or so after his respiration became distressed—the animal refused food and died in collapse. Post mortem shows great bloody extravasation in the hip and shoulder and a rupture of the muscular part of the diaphragm through which the bowels had entered into the chest.—(*Vet. Record.*)

An Interesting Case of Tympanitis [*W. Penhale, M.R.C.V.S.*].—Two-year-old heifer is very much "blown." Trocar is resorted to and laxatives prescribed. The condition was such that the canula had to be left permanently in position. After some time the appetite and rumination (which had first returned to normal) began to fail. On examining the part where the puncture had been made, it was found that the rumen had become firmly attached to the peritoneum and abdominal walls, at the place occupied by the canula, which was then useless. An incision was made through the abdominal muscles, as in case of rumenotomy, passing the hand into the abdominal cavity and tearing the adhesions existing between the peritoneal covering of the rumen and the walls of the abdomen, thus liberating the organ from these attachments. An india-rubber tube was passed into the rupture of the rumen and secured there with a stitch and its free end passed through the external opening in the muscles. By this way any tympany that might otherwise occur was prevented. Appetite and rumination soon returned and the heifer progressed favorably.—(*Vet. Rec.*)

YEW POISONING IN CATTLE [*E. Hicks*].—Out of a herd of cattle six have died. The majority of the beasts that remained were showing signs of tympanitis. Post mortem of the dead ones confirmed the diagnosis of yew poisoning. The symptoms manifested after a few hours were: Marked dullness, depression, salivation, loss of appetite, tympanitis, constipation followed by diarrhoea. Faeces were foetid, green, and in one case mixed with twigs of yew tree. In some cases there was dyspnea. Death was quick with a few animals. Fifteen animals in all died out of about forty. The treatment for the first day was sulphate of magnesia, bicarbonate of soda, carbonate of ammonia in water —and the next day liq. ammo. acet., bicarb. of soda and extract of belladonna.—(*Vet. News.*)

SALIVARY CALCULUS IN STENON'S DUCT—REMOVAL [*Capt. E. P. Argyle, A.V.C.*].—A polo pony has a calculus forming in the parotid duct, which was left without interference for several months, to allow the animal to end the polo season, as the case did not appear urgent. After four months the swelling of the duct had become larger and harder, the parotid was œdematous, the animal showed pain and difficulty in opening the mouth, and as there seems to be no possibility to move the stone in the canal its removal was decided. Anesthesia was realized with repeated application of solution of cocaine, and with the animal cast a careful dissection of the skin was made, isolating it from the tissues underneath. The duct was exposed, incised, a blunt directory introduced in it made the stone loose, when it was extracted. It weighed 40 gr. and measured 2.6 centimeters at its widest part. Recovery was uneventful in comparatively short time.—(*Vet. Record.*)

BACTERIAL NECROSIS OF THE LUNGS OF A HORSE [*Prof. G. Wooldridge, F.R.C.V.S.*].—Black gelding had abscess of the coronet of one hind foot, very painful. After two or three days others are formed in the vicinity of the pastern and fetlock. Pulmonary complications set in and death followed in a few days. Examination of the lungs shows a large number of grayish nodules of various size. They were more numerous at the apex of the lungs and looked them as small tumors. On cutting the lung tissue was somewhat œdematous. On examination of the scraping of one of these tumors the bacillus of necrosis was democrated.—*Vet. Journ.*)

TREATMENT OF FOLLICULAR MANGE IN DOG WITH AND WITHOUT VACCINES [*R. H. Smythe, M.R.C.V.S.*].—Record of the treatment applied to six dogs suffering with follicular mange, three receiving vaccines and three without it. One of the first got well, had a relapse and was destroyed. A second case also treated with vaccine improved, got distemper and died of bronchopneumonia. A third case got quite all right, became fat and lively. He, however, died of unknown cause. A fourth case received a polyvalent vaccine, but was afterwards treated by ordinary skin dressings. Had to be destroyed. The fifth case recovered without vaccine, also the sixth with being painted daily with iodine and bin-iodide of mercury in alcohol.—(*Vet. Journ.*)

FRENCH REVIEW.

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

CURIOUS PATHOLOGICAL CASE [*Mr. A. Chazeau*].—Half thoroughbred, 6 years old, this mare is the daughter and a sister to others which have always been rebellious to being harnessed. She has been broken with much difficulty and finally became quiet, not afraid and gave satisfactory work. One afternoon while driving she is taken ill on the road, stiff on her hind quarters and has profuse perspiration. Put in a stable she passes red urine containing large clots of blood. The tail is amputated as a local bleeding and the animal is walked home. The next day she is in perfect condition. Several months after it is noticed that when the crupper is passed under the tail, while she is to be harnessed, she staggers, falls as a mass and then rises alone. These manifestations returned every time at the same moment. She stands quiet for all the other parts of the harness, but staggers and falls suddenly when the crupper is passed under the tail. The eyes are normal, no saliva flows from the mouth. Again after a few seconds the animal gets up alone. The diagnosis is uncertain as the symptoms of loss of power are not explained. Prognosis serious. Was the first attack one of mild azoturia, which left the spinal cord in a pathologic condition? At any rate treatment was attempted. Massage of the lumbar region, irritating applications, bromide of potassium, phosphate of lime, sedative sachets, even very severe blistering. Temporary relief was obtained, but after a short time all the symptoms returned. Actual cauterization and electricity were not tried—perhaps they were the proper indications. The animal was sold.—(*Rev. Gen. de Med. Vet.*)

PROSTATIC HYPERTROPHY OF DOG [*Messrs. L. and E. Lepinay*].—Nine-year-old dog has a perineal tumor, some urinary troubles, difficult and painful micturation, retention of urine. On the perineum the tumor is quite big, soft and fluctuating; it gives the impression of a distended full bladder. Rectal examination confirms the diagnosis of hypertrophied prostate. The owner will not allow an operation. The dog is destroyed. At the post-mortem the bladder was found in its normal condition, but the prostate, enormously large, has at its inferior part on the right a large diverticulum which communicates with the urethra and where the urine collected. The histological examination reveals its nature, of adenoma.—(*Rev. de Pathol. Comp.*)

ENCEPHALITIS FROM UNSUSPECTED STRANGLES [*Mr. Bonet, Sanitary Veterinarian*].—Six-year-old Anglo-Arab stallion has no record of sickness. He is taken sick while at work, suddenly drops on the ground, rises and continues walking home. Put in a box, he is prostrated, head down, conjuctiva and pulse are normal; the respiration is diaphragmatic, slow, jerky and difficult. He refuses all food. Temperature 40°6 C. drops the next day to 37°8 C. The second and third day the animal is sleepy, resting against the wall, the back arched, neck is flexed, eyes half closed. Thorax and abdomen show no lesion. Rectal examination is difficult, as the animal rebels against it. Percussion of head gives rise to pain. Digestive functions are stopped, no appetite and constipation. On the fourth day agony sets in and lasts a few hours. *Post mortem:* Every organ healthy except the brain. The left hemisphere is larger than the right and contains a large abscess containing dirty white pus. Smaller collections are found with creamy yellowish suppuration. The right cerebral lobe shows a center of encephalitis. Streptococci were found in the lesions in large quantities.—(*Ibid.*)

PARTURIENT APOPLEXY FOLLOWING ABORTION [*Mr. L. Paris*].—This is a rare case, as the author, in a large practice of obstetrics since ten years, has never before observed one. A nine-year-old Normandy cow had an attack of milk fever once, which was relieved five hours after the treatment of Schmidt-Even. Lately she is again pregnant and is due in two months. She gives 8 litres of milk. But now the secretion subsides, the udder becomes soft. One morning she aborts a female fœtus. An hour later she is dull, her appetite is gone, rumination stopped and she staggers in walking. She lays in sterno-abdominal position, the neck bent

in S, she moans, makes some expulsive efforts, glairy purulent mucous at the vulva, temperature 39° C. Vaginal exploration reveals the presence of another fœtus, which is extracted easily. The envelopes are removed. The cow is made to get up, walks a few steps and suddenly drops and lays in complete lateral decubitus. The treatment of Schmidt-Even is applied and five hours after the cow has recovered.—(*Rec. de Med. Vet.*)

Sulphate of Hordenine in Canine Enteritis [*Mr. Charmoy, Adjunct Prof.*].—After a minute history of the drug with which the author has experimented he gives the record of 15 cases of enteritis which he has treated and in which he has obtained 13 complete recoveries, whether the cases were simple diarrhoea or dysentery. The treatment consisted in the subcutaneous injections of sulphate of hordenine in doses varying between 2 and 5 centigrams for each kilogram of the weight of the animal. One or two injections only had been required except in two patients, when four injections were required.

The author concludes: 1. Sulphate of hordenine, extract of the products of barley, is a medicament very efficacious in the treatment of enteritis with dogs. 2. It can be given sub-cutaneously in doses varying between 2 and 5 centigrams per kilogram of the animal, the maximum of the effects being generally obtained with an average dose of 3 to 4 centigrams. 3. The symptoms produced are: Immediately after the injection the animal is quiet, the respiration is accelerated, nausea occurs, vomiting that lasts a few minutes, then gradually all subside. 4. Practically there is no fear of toxicity.—(*Rec. de Med. Vet.*)

ITALIAN REVIEW.

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

Abdominal Localization in Distemper [*Dr. Germani*].—A six-year-old horse has sore throat and distemper. He is treated with antistreptococcic serum, receiving every day for five days 30 c.c. of the serum, divided in two doses, twelve hours apart. The sixth day the manifestations of the throat have disappeared, and the temperature is normal. A week later, relapse takes place. The horse has broncho-pneumonia, which with antistreptococcic serum injections is relieved in ten days. The animal resumes work. Twenty days after he has violent

colics and dies in a few hours. At the post mortem a large distemper abscess was found in the thickness of the intestinal coats, in the last portion of the small colon. It partly closed the intestine. Similar sequelae of distemper have already been recorded. They prove the possibility of abdominal localizations in distemper, and these may always be suspected, especially in young army horses, after recovery from an attack of distemper.—(*Il. Mod. Zoo. & R. G.*)

Rupture of the Spleen in a Horse [*T. Favero*].—Heavy draught horse, seven years old, is subject to colics since several months; they appear every twenty days and are accompanied with general digestive troubles. One day he is taken with severe symptoms, lays on the left side, struggles violently and dies. At the post mortem it was found that the horse had died because of internal hemorrhage by rupture of the spleen near the median line, due probably to passive congestion of the organ. The liver and kidneys are anemic, the stomach considerably distended with the mucous membrane, ecchymotic in places. The intestines present the same lesions. The diaphragm was torn near the great convexity of the liver—probably a post-mortem lesion.—(*R. Gen. & Il Moderno Zoia.*)

Nephro-Lithiasis of the Horse [*G. Blanchedi*].—This is the record of lesions found at the slaughter of a 16-year-old horse. The right kidney is represented by a large pouch, looking as made of connective tissue. The cortical and medullary substances are gone. In the pouch there is a muriform calculus, 7 centimeters long and 5 wide, weighing 155 grams. It is made of carbonate of lime with some oxalic acid, phosphates and probably hippuric acid. The left kidney was much hypertrophied.—(*Ibidem.*)

606 in Dourine [*T. Favero*].—It was tried with experimental dourine of dogs. Six dogs were used, one kept as control. They were infected by intraperitoneal inoculation of 10 c.c. of virus, taken from a dog after several passages by guinea pigs. The 606 was injected in the veins at doses of 12 centig, for each kilogram of the weight of the animal. The injection was made simultaneously or curatively. In this last case either during the period of incubation or after the apparition of the parasites in the blood.

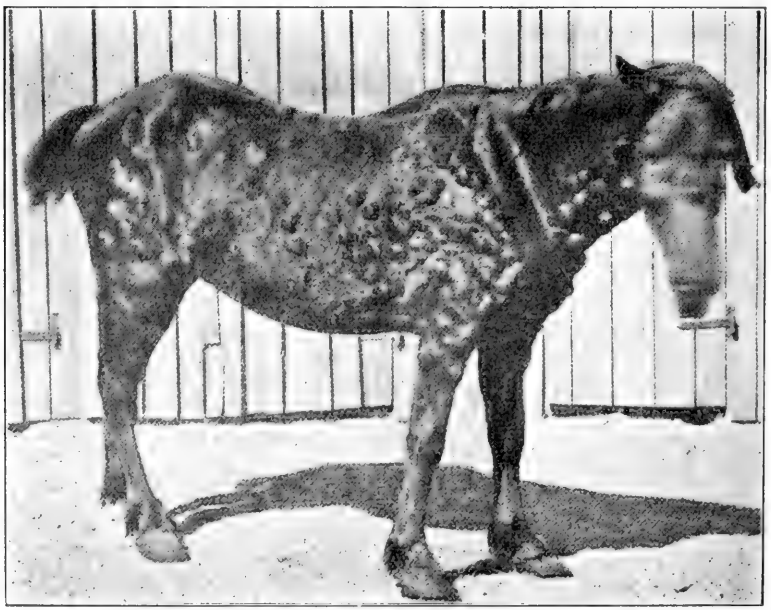
These experiments have shown that the injection of 606 at the same time as the virus, or during the period of incubation,

prevents the evolution of the disease, by destruction of the parasites. 606 has a trypanolitic action, marked and immediate, which is manifested even after the apparition of the parasites in the blood, even when they are in great number. In one animal, treated during the period of infection and expected to die soon, the symptoms subsided, and after twenty days the dog was well. The conclusions of the author are that intravenous injections of 606 have a very active action upon trypanosum equiperdum in dogs in arresting the infection, if injected at the same time as the virus, or during the period of incubation, and in rapidly destroying the parasites either at the onset of the infection, during its course or even when it has assumed a certain severe character.—(*Clin. Veter. R. G.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

A PHOTOGRAPH WITH TEXT [*A. Kragerud*].—The photograph of this horse shows numerous lymphatic nodules and is accompanied by the following report:



On superficial examination the disease somewhat resembles glanders. The body of the animal is covered with a number of round nodules, partly arranged in serial order, varying in size from a hazelnut to a walnut. From both nasal cavities a grayish, serous discharge appears, and upon both sides of the septum nasi small, round erosions are visible. The appetite of the animal is good; no fever present; and the general health is not disturbed. At the autopsy the lesions on both sides of the nasal septum are somewhat inflamed. All lymph glands in the body are swollen. Apart from the pathological condition mentioned, no other morbid changes are visible.

The history of this case is as follows: The owner states that the horse has been slightly affected for the last three years. At one time a veterinarian treated the animal for a mild attack of strangles; a few nodes appearing at first under the skin, these nodes increasing in number and size. A year and a half later a slight nasal discharge appears. Within the last three months the nodules underneath the skin, and the nasal discharge increased.

Apparently we have to deal with a case of lymphadenitis.—(*Norsk Veterinaer-Tidsskrift,* XXIV, Arg. Nr. 8-9. August, September 1912. Seite 227-228.)

STATISTICS CONCERNING INOCULATIONS FOR THE CURE OF RABIES IN THE PASTEUR INSTITUTE FOR THE YEAR 1911 [*S. Valia, Paris*].—During the year 1911, 342 persons were inoculated as a preventive of rabies in the Pasteur Institute. All were cured. Comparative figures for the previous years show that the mortality among human beings since the year 1886 (0.94 per cent. mortality) has gradually decreased, until it reached in the present year (1910) 0 per cent.—(*Deutsche Tierärztliche Wochenschrift,* No. 50, 1912.)

DECISION OF THE ENGLISH "ROYAL COMMISSION ON TUBERCULOSIS" CONCERNING THE RELATION BETWEEN HUMAN AND ANIMAL TUBERCULOSIS [*Titze*].—In the human subject three groups of tubercle bacilli are found; namely, the type humanus, the type bovinus and a third group which presents some deviations from the two first types. The type bovinus is found only in cattle and horses. In swine the commission found in 59 cases among these animals 50 harboring the bovine type, 3 animals the human type and one infected with the bovine and avine type. In a gnu, a monkey, a chimpanzee and antelope the

human type was found. The commission considered the bovine and human bacillus as varieties of one and the same species. Animals and men infect one another reciprocally. Cattle are not wholly immune to the human type of bacillus, and also the adult human being can be infected with the type bovinus, which can even produce pulmonary tuberculosis in man.

In almost 50 per cent. of the primary fatal abdominal cases of tuberculosis in children the bovine tubercle was found. Similarly, tuberculosis of the cervical glands of children and youths for the most part. The organism of lupus in 6 cases out of 20 was traced to the bovine type of bacillus. These infections are due in reality to the use of cow's milk containing tubercle bacterium. The government is therefore induced to adopt more stringent measures with regard to the control of food stuffs.—(*Deutsche Tierärztliche Wochenschrift*, No. 19, 1912.)

Contribution to the Arsenical Cure [*Military Veterinarian Karl Halasi*].—After a series of military manœuvres some horses remained in poor physical condition, notwithstanding that they were given a period of rest and increased rations. The author made some experiments with arsenical preparations. He gave daily in increasing doses from 0.20 grams to 0.80 grams of natrium arsenicum, continuing the treatment for 10 weeks. Later he treated 14 other horses, which were in poor condition also. In these latter cases the initial dose was 0.20 grams, increased every second day by 0.05 grams until the maximum dose was reached, 1.20 grams. The arsenic was administered in each instance with bread before the noon-day feed. The effect was as follows: In the first case the horses increased in weight from 12 to 20 kilos. In the latter cases the horses increased in weight on an average of 16 kilos and maintained their condition during and after subsequent manœuvres.—(*Allatorvosi Lapok*, 1912, Nr. 39.)

Acetonaemia in Cattle [*Dr. Jonk, Bern*].—The author observed frequently in cattle a form of indigestion, which occurred about fourteen days post partum. The malady was characterized by the formation of acetone and the excretion of this matter through the expired air, urine and milk. The circulatory apparatus and pulmonary organs presented nothing abnormal. The bowels were sluggish, the faeces had a dark green color and a sticky consistence and appeared glazed with mucus. The

sensorium was somewhat dulled. Jonk successfully treated this disease with the following remedies:

Extract. Aloes	25-30	grammes
Natrium Bicarbonate	350-400	"
Natrium Sulphate	75	"
Rad. Gentian	75	"

Misce, fiat pulv. One-third part to be given three times daily.

An accurate diagnosis can only be established by a chemical examination, of which there are several methods employed. The simplest test is that for the urine, practised by Blumenthal. Three to five drops of a freshly prepared dark red aqueous solution of nitro-prussiate of sodium are mixed with five cubic centimeters of urine, to this is added drop by drop a 15 per cent. solution of potassium hydrate until the dark red color disappears. After the lapse of an hour the red color changes to a greenish blue. In the same manner milk can be examined; the resulting color is then a greenish yellow. If a concentrated solution of acetic acid is added immediately and the mixture shaken, with the precipitation of the casein the solution assumes a rose red color. Further it may be remarked that the expired air, particularly when the mouth is opened, also the surface of the body, the milk and the urine emit a typical sharp, disagreeable odor. The cause of the accumulation of the enormous quantity of acetone is due, in the opinion of Jonk, to the disintegration of the albumen. Without doubt the gastric glands participate in the etiology of the disease.—(*Münchener Tierärztliche Wochenschrift*, 1911, No. 19 and 20.)

Veterinarian Sustains Heavy Loss by Fire.—The building containing stable, hospital and office of Dr. C. E. Burchsted, Concord, N. H., was recently destroyed by fire, in which the doctor lost his beautifully equipped office, including his diploma and many valuable dachshunds, all prize winners, two of which were entered for the dog show in New York, February 20-21-22. The doctor has our sincere sympathy and, we are sure, that of every one.

A Progressive Veterinarian in Nebraska writes: "Enclosed find draft for $3 for the '*Good old* Review'; have taken it since three months before I graduated and could not live without it. Yours for best success, etc."

CORRESPONDENCE.

GLANDERS.

BROOKLYN, N. Y., February 9, 1913.

Editors AMERICAN VETERINARY REVIEW:

GENTLEMEN—The AMERICAN VETERINARY REVIEW is always a welcome visitor, especially since I can claim to be one of its founders. I take pleasure in watching its substantial growth, which is ample proof of its adaptation to the wants of the profession.

Your reports of society meetings are always interesting reading, particularly to non-society members. I take it for granted that your report of the December meeting of the Veterinary Medical Association of New York City is correct.

The chairman of the committee appointed to investigate the case of Mr. Benj. H. Mount, who was supposed to be infected with glanders, concluded "that the patient did not exhibit any positive symptoms of glanders," as per said report upon the case.

Now, gentlemen, take the history of this case and the clinical lesions exhibited: they could lead to one conclusion only, *i. e., glanders.* With such history and lesions, what else could it be! But bide a wee.

In your January number it is reported that Mount had developed a positive case of glanders. From the history and lesions indicated there could be no other termination.

As to the views expressed and discussed at the December meeting, of cases of glanders and farcy making complete recoveries: in my sixty years of active practice I never have known of an animal affected with glanders or farcy to recover to a normal condition.

One member, in his official capacity, relates that he had made post mortem examinations on two cases that had external farcy lesions, but no visible *internal* lesions. In the name of equine pathology what did he expect to find?

Both the medical and veterinary professions in Brooklyn have had ample opportunities of becoming familiar with the etiology and pathology of equine glanders. There is no other city where

the scourge is so prevalent and widespread. It is more prevalent to-day than it was twenty years ago, taking into consideration the relative number of horses.

The increase is what might be expected, when one knows the method of stamping out adopted by the local authorities. Veterinary surgeons are expected to report all cases of contagious diseases in animals to the Department of Health, including glanders and farcy. Then the Department veterinary expert visits said animal, sometimes the same day, but frequently not until the elapse of four or five days, in order to give the veterinary inspector from Albany time to get here and confirm the diagnosis. The affected animal all this time is allowed to cohabit unrestricted with the other animals. No isolation of said suspected case during the interval.

The inspector makes no further examination, though there may be other animals showing pronounced clinical lesions. He is in too great a hurry. Then follows a form of disinfecting the individual stall occupied by the condemned animal. He calls for a pail of water, into which he drops so many tablets of bichloride of mercury, with which he sprinkles said stall, using, usually, an old broom. This so-called disinfecting extends also to the feed remaining in the stall, which may be used by the next tenant. The disinfecting of the harness and blanket used by the affected animal is completely ignored.

Such being the system employed for the stamping out of glanders, are you surprised at its perceptible increase in this city?

The vital point is that the local authorities have in their employ so-called members of my profession who, for the past twenty years, have sanctioned these lax and ineffectual methods, resulting in discredit to the veterinary profession.

Those in charge of the stamping out of glanders must give more attention to the life history of this germ which propagates this disease. It has a latent period, in the system, of undefined duration, showing no clinical symptoms, *at which time the mallein test should be used in every case* of animals that have cohabited with affected cases; mallein being, in my experience, a reliable test.

Until the great importance of a test during this latent period is realized there will continue to be a criminal propagation instead of a wholesome stamping out of this disease.

Some years ago I had the honor of being appointed veterinary inspector by Governor Robinson in stamping out bovine contagious pleuro-pneumonia in this state, and was strictly successful

within a period of two years; but certainly not by such methods as the local authorities of to-day have been using in stamping out glanders.

Yours truly,

L. McLean, M.R.C.V.S.

THE SECRETARY OF WAR DECIDES THAT VETERINARIANS MUST TAKE THE ANNUAL OBSTACLE RIDE.

Editors American Veterinary Review, *New York:*

Early in December, 1912, the Secretary of War decided that such portion of a previous order excusing chaplains and veterinarians from taking the annual obstacle ride be rescinded as to that part pertaining to veterinarians, and that commanding officers would have the veterinarians take such ride with the officers of the regiment.

This decision will no doubt be taken with disfavor by some of the Army veterinarians, but it seems that we should all be well up in matters pertaining to horsemanship as well as to their medical attention, and it is no greater hardship for the older veterinarians than the older line officers.

It is true the Army has become very enthusiastic over jumping and steeplechasing, but it is not without its good results, since it is bound to make better horsemen and bolder riders.

Now that we are recognized in this matter I think it is up to us to take up this work cheerfully and show the line officers that we are their equal at least in horsemanship.

Both veterinarians of one regiment were ordered out after this decision was rendered and made the ride, finishing within the time, and did it in as good form as any officers of the regiment.

The ride as now prescribed consists of a course three miles long over rolling country, with nine obstacles, consisting of ditches, logs, rail fences and brush hurdles arranged three to each mile, and the time limit is eleven minutes. This is not fast time, just an extended gallop, and a horse well conditioned can make it easily in eight or nine minutes, as has been proven by the tests made since the ride was inaugurated.

(Signed) Army Veterinarian.

BIBLIOGRAPHY.

VETERINARY TOXICOLOGY.

VETERINARY TOXICOLOGY, by G. D. Lander, D.Sc., F.I.C., Professor of Chemistry and Toxicology, Royal Veterinary College, London. More than 300 pages, with 39 illustrations. Chicago, Alexander Eger, 1912.

This excellent work of Professor Lander, the bulk of the analytical data of the text of which is based upon cases of poisoning coming under his observation during the past nine years, is of inestimable value to practising veterinarians. The author has also done a tremendous amount of reference work, so that the compilation includes the findings of an imposing list of authorities on the subject. Thirty pages are devoted to the introduction of the subject, in which the definition of a poison, general chemistry of poisons, conditions governing the action of poisons, variations of action due to species, variations of action due to the individual, classification, common causes of poisoning, kinds of poisoning, diagnosis of poisoning, treatment, post mortem and chemical analysis are severally treated. This is followed by chapters on Mineral or Organic Poisons, under which arsenic, antimony, lead, mercury, copper, zinc, silver, barium, chromium, iron, phosphorus, ammonia, strong acids and alkalis, common salt, nitrates, sulphur, halogen elements and their compounds, and carbon monoxide are treated in the order named, and on Organic Poisons and Drugs, in which hydrocyanic or prussic acid, strychnine, morphine and opium, eserine or physostigmine, pilocarpine, ipecacuanha and emetine, gelsemium, veratrine, curarine, yohimbine, cocculus indicus, cannabis indica or Indian hemp, santonin and wormwood, turpentine, camphor and essential oils, oxalic acid, alcohol and cantharides are considered in the order given. One hundred and thirty-six pages are then devoted to poisonous plants, in which the 39 very excellent illustrations occur. In discussing these poisonous plants, the grains per body weight in the horse, ox, sheep, goat and pig are given in each. The closing chapters treat of Chemical Toxicology and Ptomaines. The author's very clear manner of expression renders the profound and complex subject, which he presents in *Veterinary Toxicology*, pleasant and comprehensive reading, which is destined to make the work popular with students and practitioners. The publisher has executed his part of the work well, and given the book a quiet elegance in the binding, in keeping with the weight of the author's subject.

ANIMAL PARASITES AND PARASITIC DISEASES.

ANIMAL PARASITES AND PARASITIC DISEASES, second edition, revised; by B. F. Kaupp, M.S., D.V.S., Professor of Pathology and Parasitology, Veterinary Department, Colorado Agricultural College. Late Professor of Parasitology, Kansas City Veterinary College. Late Veterinary Inspector, Bureau of Animal Industry, United States Department of Agriculture, etc. More than 200 pages, with 120 illustrations. Chicago, Alexander Eger, 1912.

This excellent little work is one of the most useful reference books for the practitioner in type; because it embraces a subject upon which the average practitioner gets rusty, especially in terminology, differentiation and specific treatment, after a few years in routine practice, and finds a work of this kind very convenient to refer to. By its use in that way a practitioner can treat parasitic conditions much more satisfactorily to himself and his clients, and can keep up on a branch of medicine that is as important as it is intricate. The work is concise and is divided into four chapters as follows: External Parasites, Internal Parasites, Protozoa and Preparation of Specimens. The names of the parasites are arranged in tabular form at the beginning of each of the first three chapters. In the first column of the table will be found the *Branch;* in the second the *Class;* in the third the *Order;* in the fourth the *Family;* and in the last the *Genus* and *Species,* names by which we know the parasites. So that by reference to this table, one can readily trace each species down through the classification to the starting point, the *branch.* The facts about each are noted under headings: Synonym, Distribution, Life Cycle, Animals Infested, Conditions Produced, and Treatment, when treatment is indicated. The photomicrographs used in illustrating the work were made by the author with an ordinary kodak placed over the ocular lens of the microscope, giving a time exposure, and are excellent. The concise information and arrangement for ready reference makes *Animal Parasites and Parasitic Diseases* indispensable, alike to the student and the practitioner of veterinary medicine. The paper is smooth, the type clear and sharp, and the binding in red and gold very pretty and a credit to the publisher.

THE BOOK OF LIVE STOCK CHAMPIONS.

THE BOOK OF LIVE STOCK CHAMPIONS; an Artistic Souvenir Supplement of the *National Farmer and Stock Grower;* by Philip H. Hale, Editor. 352 pages, with 679 illustrations. 1912. Hale Publishing Co., St. Louis, Mo.

This work is as interesting as a spicy novel and as instructive as a text-book; and the best part of it is, it is fact. Reproduc-

tions right from life of live stock champions of the day; horses, cattle, sheep and swine—the best that has been produced; the *crême de la crême* of the live stock world. Can anything *more* instructive or *more* interesting be imagined than the portrayal of these champions in animated poses, making the pictures strikingly life-like, with a brief but accurate description of each animal beneath the picture, giving the name of the animal, name of the owner and exhibitor, where and when exhibited and the prizes taken? Every veterinarian who learns of this book will want it, and *no veterinarian can afford not to have it.* Because if he attends stock shows it will interest him, and if he is not in a position to attend such shows it will instruct him in the very line in which veterinarians are so deeply interested, and with which they are so closely allied to-day. *The Book of Live Stock Champions* is virtually a live stock show in your own library with nearly seven hundred entries, and all champions; affording its readers a splendid opportunity of becoming connoisseurs in live stock judging, as nothing but the best is exhibited, and they may give as much time to each class as they desire, for which they are under great obligation to Mr. Hale, editor of the *National Farmer and Stock Grower*, who has edited and published the "*Live Stock Champions*" as a souvenir supplement to his paper.

PRINCIPLES OF ECONOMIC ZOOLOGY.

PRINCIPLES OF ECONOMIC ZOOLOGY, by L. S. Daugherty, M.S., Ph.D., Professor of Zoology, State Normal School, Kirksville, Mo., and M. C. Daugherty, Kirksville, Mo. 12mo. of 410 pages, with 301 illustrations. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, $2.00 net. W. B. Saunders Company, Philadelphia, London.

Principles of Economic Zoology is one of the most interesting books that it has been our pleasure to review for some time. From the moment that you begin with the *protozoa* until you finish with the *mammalia*—theories of development, history and theories of evolution—it continues to get more fascinating with each chapter. The illustrations are beautiful, and are in themselves an education in natural history.

The paper used in this work is of a very high quality, the type clear and sharp, and the binding neat and elegant, befitting the character of the book. *Principles of Economic Zoology* should find a place in the library of all scientific men and is essential to the student of structural zoology.

Bibliographic Notes.

Mulford's Veterinary Bulletin for January arrived at the Review office during that month and has been read with a very great amount of pleasure and satisfaction. Pleasure because of the many interesting and helpful articles it contains; satisfaction because of its ethical character. This little bulletin, although published by a drug house, has much to commend it from a scientific standpoint; and the cleanness of its pages merits the emulation of more pretentious journals.

The January, 1913, number seems to be an especially good one. An interesting discussion of the hog cholera problem, editorially, is followed by several articles by prominent members of the veterinary profession. Among others, H. Caulton Reeks, F.R.C.V.S., on "Impaction of the Caecum in the Horse," of unusual interest, and John Reichel, V.M.D., on "Contagious Abortion Bacillus Vaccine." Altogether, it contains quite a goodly number of original articles and case reports, and is a valuable little booklet.

The Journal of the U. S. Cavalry Association for January, 1913, is an especially good number, containing many excellent articles; among others, one by Dr. Gerald E. Griffin, entitled "Fort Keogh Remount Depot."* one by Capt. Edward Davis, 13th Cavalry, on "The New Cavalry Equipment," and several reprinted articles on needs and scarcity of horses, American horses for cavalry, saddle-bred army horses, etc., etc., that make especially interesting reading for veterinarians.

Our Dumb Animals for February reached the office early in the month, with its usual store of good advice and lessons of mercy—and its work is much to be commended.

Other Periodicals Received, are *The Veterinary Journal* (London), *Berliner Tierärztliche Wochenschrift, Deutsche Tierärztliche Wochenschrift, Indian Civil Veterinary Department Memoirs, Agricultural Journal of the Union of South Africa, The Philippine Journal of Science, The American Journal of Clinical Medicine, North-American Journal of Homoeopathy, The Bacterial Therapist, The Farmer's Advocate* (Winnipeg), *The Rider and Driver, Breeder's Gazette, Hoard's Dairyman, The Live Stock Journal* and several bulletins.

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* Published in this issue of the Review, on page 662.

SOCIETY MEETINGS.

NOTES ON THE SEMI-ANNUAL MEETING OF THE MISSOURI VALLEY VETERINARY ASSOCIATION AT KANSAS CITY.

The Missouri Valley Veterinary Association held a three-day meeting in Kansas City, January 21-22-23, which was attended by over 250 practitioners. General interest in the program was sustained throughout the entire meeting. So spirted was the discussion of some of the papers that the literary program was extended into the third day, which had been set aside for the clinic.

Dr. B. F. Kaupp, Chicago, Ill., presented the subject of "Contagious Abortion," and his paper drew out an interesting and very practical discussion.

Dr. S. L. Stewart read a paper on "Equine Meninges and Some Pathological Alterations," and the subject was made intensely interesting by the exhibition of several prepared specimens illustrating the chief points made in the paper. The anatomical problems brought out in the paper and illustrated by the specimens was a very good introduction to the topic which followed, namely, "The Recent Horse Plague" in western Kansas and related parts of adjacent states. This latter subject was to have been presented by Dr. A. Bostrom, of Lincoln, Neb., but as he was unable to attend, the several persons assigned for the discussion of this paper gave the theme an instructive and extended presentation. The general opinion as to the etiology concurred with the forage poisoning theory, there being only a few who advocated the theory of verminous origin. The flagrant violation of professional ethics by many, both resident veterinarians and those who flocked to the scene of possible grafting, from outside, received special attention, and several speakers urged punishment of the offenders.

The session held on the evening of the first day was opened by a letter from Dr. R. W. Ellis, of New York City, explaining his unavoidable absence, and the reading of his paper by the Secretary, entitled "The Trend of Veterinary Practice in Eastern Cities."

The second paper was presented by Dr. F. M. Starr, of

Odessa, Mo., describing some cases of bovine pneumonia, which simulated contagious pleuro-pneumonia. The discussion brought out the probability that the cattle had been affected with the pectoral form of hemorrhagic septicemia. It was made plain that a number present had observed similar cases.

A paper by Dr. A. D. Glover, of La Belle, Mo., on "Purulent Infection of the New-Born," touched the experiences of many and led to a lengthy discussion.

Wednesday morning, January 22, the meeting reconvened with a full attendance, the first paper presented being on "Embryological Operations and Forced Traction in Dystocia of Large Animals" by Dr. J. V. Lacroix, Kansas City. The discussion of this very practical paper was quite general.

Dr. Julius A. Jessen, of Irwin, Iowa, presented a very carefully prepared paper on "The Descent of Animals," which attracted close attention.

Dr. J. Harvey Slater, Richmond, Mo., read a paper on "Tetanus," which was of a practical character, and the extended discussion given to the subject was indicative of a very wide interest in the problem that seems to be ever with us.

"The Surgical Treatment of Bone Spavin" was the title of a paper presented by Dr. R. R Dykstra, of Manhattan, Kan., and which offered some new points in the treatment of this malady and developed the diversity of the opinions held by practitioners, so fully brought out by the extended discussion.

The feature of the afternoon session was a paper illustrated by lantern projection on the "Diagnosis of Hog Cholera," by Dr. J. W. Connaway, of Columbia, Mo. Every member present took a lively interest, as there are new features of the problem developing with each day's experience. The discussion in part centered around the finding of complications, which ofttimes obscure the diagnostic lesions of cholera. The old distinctions between hog cholera and swine plague were in part revived. Another point brought prominently to the fore was the belief by many that the use of virus in the simultaneous method of immunizing against cholera led to the propagation of cholera more widely throughout the States.

Resolutions of endorsement of the pending Army Veterinary Bill were adopted and the Secretary instructed to inform Senator Bristow by wire of the action of the association. Further the members generally agreed to individually send communications to United States Senator Bristow, expressing their personal approval of the bill.

The several case reports occupied the remainder of the afternoon session.

In the evening of the second day about 150 veterinarians sat around the banquet board at the Coates House, and after enjoying a lively visitation, while participating of a splendid repast, terminated the evening's exercises by attention to numerous short addresses by the President, Dr. George R. Young, of Omaha, Neb.; Dr. Joseph Hughes, of Chicago, Ill.; Dr. D. B. Morgan, of Neosho, Mo., and others. Mrs. S. L. Stewart, of Kansas City, responded to a toast to the ladies in a most happy and pleasing manner. The speeches were interspersed by the musical numbers rendered by the Kansas City Veterinary College Glee Club and some lady friends of the local members.

On Thursday morning, January 23, the association convened in the auditorium of the Kansas City Veterinary College, there to complete its literary program, consisting of a paper on "Interstate Inspection of Live Stock," by Dr. T. T. Christian, of Texarkana, Texas. The points in the paper particularly relating to honesty of inspection, and reasonable charges therefor, elicited a spirited discussion and hearty approval.

"A Retrospect of the Results of Tuberculin Testing," by Dr. F. W. Caldwell, St. Joseph, Mo., and the discussion which followed sustained the superiority as well as convenience and economy of time of the intradermal method over all others.

During the several sessions many applications for membership were presented and acted upon, there being received in all about 30 new members.

After the disposition of routine business the literary session was adjourned to participate in the clinic, which took place in the college amphitheatre. This feature of the meeting continued to hold the attention of the members until the shades of night came on, and with all it was generally stated that this had been a record-breaking meeting in volume of work done and in its educational and social features.

MEETING AND SESSION OF THE PERMANENT COMMISSION OF THE INTERNATIONAL CONGRESS OF VETERINARY MEDICINE.*

Friday, the 25th of October, 1912, at Lyon in the Library Hall of the National Veterinary School, at 9 o'clock a. m.

* Translated for publication in the AMERICAN VETERINARY REVIEW by Prof. L. Van Es, North Dakota Agricultural College.

Mr. Faure, the director, receives the members in the convocation hall of the school and bids welcome to the president and to the members, a large number of whom have come in order to assist at the same time in the celebrations of the school.

He thanks them very cordially for the splendid photograph of all the members of the commission, which offering to the Lyon school is exhibited on a table of the hall. At the same time he delivers an official letter expressing the thanks of the teaching corps of the school for this high token of sympathy. Mr. Faure says finally that the commission will find a hall more quiet and appropriate for its work in the library. At the same time he invites the members to a breakfast offered by himself and the professors of the school.

The president thanks Mr. Faure very sincerely for his hospitality and his good care for the commission, after which Mr. Faure withdraws and the commission begins its labors.

Are present: Mr. Lydtin, Germany, president; Mr. Hutyra, Hungary, and Mr. Degive, Belgium, vice-presidents; Mr. de Ratz, Hungary, adjunct secretary; Mr. Happich, Russia; Mr. Hangka, Austria; Mr. Hess, Switzerland; Mr. Theiler, South Africa; Mr. Piot, Egypt; Mr. Perrincito, Italy; Mr. McFadyean, England; Mr. Stockman, England; Mr. Schimmel, Netherlands; Mr. Locusteanu, Roumania; Mr. Barrier, France; Mr. Kjerrulf, Sweden; Mr. Malm, Norway; Mr. Bagg, Denmark, and Mr. de Jong, Netherlands, secretary.

Order of Business.

I. Report of the secretary on the activity of the commission since the meeting at Baden Baden in June, 1911.

II. Resolution on the installation of the permanent secretaryship at the Hague (thirteen countries represented in the commission have approved, eight countries have until now not responded).

III. Resolution on the proposals of the English executive committee:

a. On the date of the London Congress.

b. On the questions to be treated at the London Congress.

c. On the organization of this Congress.

IV. Measures to be taken to obtain the participation of veterinarians, physicians and agronomists of all countries in the London Congress and the aid of the press.

V. Wishes and proposals of the members of the commission.

1. The president, in opening the session, once more thanks

the director of the Lyon school for the hospitality and reads a letter from the Austrian Minister of Agriculture announcing that Mr. Hangka has been delegated to take the place of Mr. Binder. He puts the question if Mr. Hangka would have the right to vote. The assembly responds in the affirmative. After this he reads a letter from the Bulgarian Minister, who excuses the absence of Mr. Tuleff, of Sofia.

2. The photograph of the members, offered to the school of Lyon, has cost about 260 francs, including the frame and the naming of the members upon a metal plate. The president hopes that the members will be so kind as to pay their part of the expense to the secretary. The photographer has added a reduced reproduction for the record. The members who likewise desire such a reproduction should apply to the secretary.

3. The committee of the library exposition of Leipzig in 1914 has invited the commission to organize an excursion to Leipzig on the occasion of this exposition. The president had to answer that this excursion will not be possible on account of the London Congress.

4. The secretary reads the report on the labors of the commission since the session of Baden-Baden in June, 1911. The report is approved and accepted.

5. The president gives the floor to Mr. de Jong to report on the installation of a permanent secretary's office at the Hague. Mr. de Jong relates the correspondence as a result of the resolutions passed at Baden Baden. The members of eight countries represented in the commission have not yet made answer. Of thirteen countries the answer was favorable. The majority thus far approved the project, while a few members have, it would seem, not yet made the desired efforts. Mr. de Jong adds that the remnant from the Congress of the Hague, resulting from an extraordinary contribution of the Netherland Government has been quite diminished after the meeting of Baden Baden, not only by the expenses caused by the Congress of the Hague, but also by the expenses of the commission itself and which are quite important. It would be well to recommend to the Executive Committee of London to bear in mind those actual and future expenses of the commission if the situation remains the same. In spite of this the surplus of the Congress of the Hague will probably be sufficient for the provisional installation of the secretary's office at the Hague.

Mr. de Jong consequently believes that it will be in the interest of the commission to obtain this surplus for the installation of

its secretary's office at the Hague, which aside would have the projection of the Minister of Agriculture of the Netherlands. Not only the congresses of medicine, but also those of pharmacy and hygiene and demography already have their office at the Hague, and it seems a little peculiar that the veterinary congresses, of which the permanent commission is older than that of the congress of medicine, are much behind in this respect.

Mr. de Jong proposes thus to wire to the Netherlands Minister of Agriculture that the commission definitely accepts His Excellency's offer. He has authorized Mr. de Jong to let the permanent commission know that he has always had the intention to be favorable to the installation of the secretary's office at the Hague.

During the discussion a few members excused themselves of not having had the opportunity to state the answer of their Ministers, while a few wish to see the question treated through diplomatic channels, and still others wish to submit it to the London Congress in 1914. But the majority of the members expresses its great obligation toward the Dutch Minister, who thinks so generously regarding the commission.

Messrs. Barrier, Malm, Theiler, Biot, and others wish to accept the secretary's office at the Hague, while Mr. Hess proposes to ask the Dutch Minister of Agriculture to first ask the approval of the other countries, a proposal which is regarded as very importunate by Mr. de Jong.

The president says that paragraph 14 of the by-laws of the congresses of medicine says simply "the office is stationary at the Hague." This decision has been made by the physicians without asking beforehand the approval of the government or competent ministers of their countries. At this time the commission, which is authoritative only, has to see if there are obstacles which oppose themselves to the realization of the provisional resolutions of Baden-Baden. If not, the present assembly can pass a definite resolution, and when the commission wishes to address the Dutch Minister of Agriculture, it can only do so to thank His Excellency very much for his good intentions regarding the permanent commission. The latter has to write in its by-laws: "The commission has a fixed office at the Hague." This, besides, does in no way limit the freedom of action and the independence of the commission.

After some discussion on the organization of the office, the president first puts the proposal of Mr. Hess (Switzerland) to a vote. The latter retires, but wishes that this be recorded in the

minutes. Then the proposal to establish the office at the Hague under the conditions established at Baden-Baden is unanimously accepted.

The president expresses his thanks to the Dutch Minister of Agriculture. The commission sends a message to His Excellency, communicating to him the resolution and expressing to him its gratitude. In the course of the meeting an amiable answer from His Excellency is received.

6. On the proposal of the English members, and after some discussion, the date of the next Congress at London is fixed for the first week in August, 1914 (6 days).

As to the organization, Mr. McFadyean, who with Mr. Stockman had presented a provisional program, says that he borrowed it from the Congress at the Hague, but that he has proposed less general sessions. Many members, among others Messrs. Degive and Barrier, on the contrary, desire more general sessions. After some discussion on the subjects to be treated and on the sections, the organization of the Congress is entrusted to the English executive committee, which will reckon with the desires of the permanent commission, which recommends above all to avoid conflicts between the general sessions and those of the sections. Among the questions which should be treated by the general sessions were named: Tuberculosis, foot and mouth disease, intoxication by animal food-stuffs, sanitary milk control, the causes of abortion, veterinary education, and others. As subjects for the sections were recommended questions of pathology and bacteriology, enzootics, medicine and surgery and the tropical diseases.

Mr. de Jong recalls, besides the questions to be treated remaining over from the Congress of the Hague, and made known that Messrs. Van Es (United States), Lignières (Argentine) and de Blieck (Buitenzorg, Java) have expressed special wishes concerning the Congress.

Of this he makes report to the English members to whom also was forwarded a wish from a veterinarian of the Allgau.

To a question of Mr. Barrier, relating to the budget of the future Congress, Mr. McFadyean gives a very reassuring answer. From three to four thousand pounds sterling are already available, and a still more considerable sum is expected. The Congress finds a good deal of sympathy in England. The official invitations will be made by the Minister of the Exterior of Great Britain. Mr. Barrier recommends to send the invitations early.

The president thanks Messrs. McFadyean and Stockman for

their reports. Concerning the London Congress the formation of National Committees in all countries is recommended and Mr. McFadyean wishes that the members of the commisison would also kindly encourage the attendance of the Congress of London, which will celebrate the semi-centennial of International Congresses. The president remarks that it will be urgent to ask above all for the assistance of the press, including the political press and especially the English one.

Mr. Stockman wishes communication of the names of the secretaries of the national committees as soon as possible.

7. Before the closing of the session Mr. Barrier expresses thanks to the president. It is true that the commission is an institution of great usefulness, but it is also true that especially the president does much work in the interest of the tasks of the commisison and of the congresses. He deserves the homage of all the members for this.

The president thanks Mr. Barrier for those words, emphasizing that all he has been able to accomplish is due to the support of the members and above all to the indefatigable labors of Secretary de Jong. He closes by rendering homage to France and the School of Lyon in consideration of the hospitality and cordial reception, which the permanent commission has met there.

(Signed) Dr. Lydtin, President,
D. A. de Jong, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The twenty-ninth annual meeting of the above association was held at Achtel-Stetter's, Broad street, Newark, Thursday, January 9; President T. E. Smith in the chair and the following members present: Drs. Dickson, McDonough, J. T. Glennon, A. W. Smith, R. E. Mosedale, Lubach, Baldwin, Mitchell, William Herbert Lowe, Conover, George Smith, Bair, Hurley, Jones, Thompson, A. G. Hopper, J. B. Hopper, Charles Magill, Churchill, Lindsay, Paulin, Fredericks, Harrison, Ramsay, J. Payne Lowe, Harker, T. B. Rogers, Belloff, Schlommer and Loblein. Visitors, Dr. McLaughlin, of New York; Dr. Hoskins, of Philadelphia; Dr. Runyon, of Freehold, N. J.

A motion to suspend the roll call was offered and passed.

The minutes of the semi-annual meeting and the two special meetings were read and approved.

One proposition for membership was received, that of Dr. Bruce Blair, of Jersey City. Dr. Blair was later elected to membership.

In his annual address the president recorded the history of the association during the past year and made a number of suggestions. He touched very feelingly upon the death of ex-President T. Earl Budd, of Orange, who succumbed to the dreaded disease anthrax, after posting an animal which had died from the disease. The address was well received by the members present.

President Smith reported on the Army Legislation Bill, and Dr. Hoskins, father of the bill, made an earnest appeal for the members to use every effort for the passage of the bill by the Senate, the House having already passed it unanimously.

The Prosecuting Committee reported that one case of unlawful practice had come to their notice, but that the man had left the state before any action was taken.

Dr. J. Payne Lowe, chairman of the Public Health Committee, reported that the committee was active and made some excellent suggestions toward progress in public health matters.

The Special Legislative Committee presented an extensive report in the form of a rough draft of a bill entitled, "An Act creating a Bureau of Animal Industry in New Jersey."

This bill seeks to form a Bureau of Animal Industry composed of the president and secretary of the State Board of Agriculture, the president of the State Board of Health, and the husbandman of the State Experiment Station, with a veterinarian as the executive head of the bureau. As outlined in the bill, the work of this bureau will be the handling of all diseases of animals.

The association passed a resolution approving of the bill and sent it back to the committee for corrections and finishing, so that it can be presented at the present session of the Legislature.

The resignation of Dr. S. G. Hendren was read and the following resolution was adopted:

"Resolved, That the Veterinary Medical Association of New Jersey accepts with deep regret the resignation of Dr. S. G. Hendren, and the secretary is hereby instructed to place the name of Dr. Hendren on the list of honorary members of the association."

The report of the treasurer, Dr. McDonough, was read and approved by the auditing committee.

The secretary reported that 21 members had been dropped from the rolls during the past year for non-payment of dues. It was reported that Dr. A. Brown, of Heightstown, N. J., was an invalid and a resolution was adopted continuing his name on the roll and remitting his dues.

President Smith, in behalf of the association, presented Dr. T. B. Rogers, president of the association in 1911, with a beautiful gold watch as a mark of the appreciation and esteem in which he is held by the association. Dr. Rogers responded very graciously.

A motion was passed giving the president power to appoint a committee of three to draft suitable resolutions on the deaths of Drs. Budd, Stage and Buhler, which occurred during the past year. President Smith appointed the following committee: Chairman, Dr. W. H. Lowe, and Drs. J. B. Hopper and T. B. Rogers.

Election of officers was then held and all of the officers of the past year re-elected as follows: President, T. E. Smith; 1st Vice-President, J. T. Glennon; 2d Vice-President, J. Payne Lowe; Treasurer, James McDonough; Secretary, E. L. Loblein.

The literary program consisted of two excellent papers.

Dr. J. A. McLaughlin, of New York City, read a very deep original paper entitled "The Outlines of a New Physiology," which left much food for thought.

Dr. James McDonough discussed "The Effect of Hoof Expanders on the Foot."

Both papers were well enjoyed and brought forth excellent discussions.

E. L. Loblein, Secretary.

THE NEBRASKA VETERINARY MEDICAL ASSOCIATION.

A special meeting of the above association was held in the veterinary building at the University Farm, Lincoln, Neb., on December 30 and 31, 1912, for the purpose of discussing various legislative measures.

Particularly the creating of a State Live Stock Sanitary Board and the proposed amendments to the Veterinary Practice Act.

Dr. J. S. Anderson, chairman of the Legislative Committee,

reported that amendments to the Veterinary Practice Act had been drawn up and were ready to be presented to the association for discussion, and which were adopted after considerable discussion when they were submitted. The committee had also been working on a bill to create a Live Stock Sanitary Board.

It was then moved and carried that the Legislative Committee be authorized to act with the committee appointed by the live stock associations as they deem fit, with a view of arriving at some agreement of co-operation in drafting a bill whose provisions should be fair to all concerned.

Meeting adjourned, to meet again the following morning in the same place at 9 o'clock.

On Tuesday morning, December 31, the meeting was called by Dr. J. D. Sprague. Dr. Anderson reported that during the interview which the Legislative Committee had just had with Mr. Crocker, secretary of the Live Stock Committee, it was mutually decided that a bill should be drafted to create a Live Stock Sanitary Board; said board to be composed of four stockmen and one veterinarian, these to be appointed by the Governor, and they to appoint the State Veterinarian, who shall be the executive officer of the board.

After considerable discussion it was decided that the members render all possible support to this bill in the next legislature.

Dr. W. H. Tuck, chairman of the Prosecuting Committee, was then asked to report and replied by asking that Dr. Norden, the secretary of this committee, be asked to render this report, as he had more of the data. Two empirics had been prosecuted, one in Lincoln by the name of Vincent, who was convicted and fined $25 and costs upon being rearrested after having had his bond of $200 forfeited a week previous for non-appearance; the other was Mr. Gregg, at Litchfield, Neb., who was prosecuted and fined $25 and costs in the County Court at Loup City, Neb.

A motion was then made and carried authorizing the committee to collect more contributions to the prosecuting fund from the veterinarians over the state to provide for the continuance of this work.

Association adjourned until the regular meeting in January.

* * *

The annual meeting of this association was held in the veterinary building at the University Farm, Lincoln, Neb., January 14, 1913, which was called to order at 1 o'clock p. m. by the president, Dr. J. D. Sprague.

After the reading of the minutes of the previous meeting by the secretary, Dr. W. H. Tuck, and their approval by the association, Dr. Anderson, as chairman of the Committee on Legislation, was asked to report, in response to which he reported good progress with the Live Stock Sanitary Board Bill and the one providing for amendments to the Veterinary Practice Act, both of which would soon be ready to introduce into the legislature.

This report was made to a most appreciative audience, as every one felt that the committee had worked hard and earnestly in trying to obtain these two important measures, which are so badly needed, and the tact and diplomacy used was most commendable.

Dr. J. A. De Cow, chairman of the Executive Committee, reported on twenty-eight candidates for membership as being properly vouched for, who, on motion, were all unanimously elected members of the association.

After the disposition of various business matters the following officers were elected for the ensuing year:

President, Dr. J. C. Bowman, Tecumseh; Vice-President, Dr. L. P. Carstenson, Columbus; Secretary and Treasurer, Dr. Carl J. Norden, Nebraska City.

Association adjourned.

CARL J. NORDEN, Secretary and Treasurer.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION.

The nineteenth annual meeting of the above association was held in Richmond, January 9 and 10, 1913. The meeting was called to order in the spacious parlors of the Jefferson Hotel, at 8 o'clock p. m., by President Ferneyhough, of Burkeville, State Veterinarian. After the usual routine of opening, the association adjourned to await the report of the Board of Censors and other committees.

Upon the recommendation of the Board of Censors five new names were added to the roster. Several instances of unqualified practitioners and other violations were reported, and the whole subject was referred to a committee on resolutions, with a request that they report at the next meeting.

January 10, 1913, President Ferneyhough called the association to order, promptly at 9.30 a. m. After the reading of the

minutes the president, in a few well-chosen words, introduced Hon. Roswell Page, a brother of the distinguished Virginia novelist, who delivered a very excellent address of welcome, which was responded to by Dr. Faville. Dr. W. Horace Hoskins, of Philadelphia, who was present, addressed the meeting in his usual happy style. While the doctor is still a young man, his allusions to the early history of the profession in the United States made some of us feel that time is surely flying.

Dr. W. G. Chrisman, State Veterinarian of North Carolina, gave a very full report of his work in the prevention of hog cholera by the use of anti-hog cholera serum. His work in North Carolina has been eminently successful, but from the discussion of the subject, and the experience as related by the members present, it would seem that the serum supplied by the State of Virginia is not uniformly reliable.

Dr. R. W. Hickman, chief of the Quarantine Division of the Bureau of Animal Industry, read a very interesting paper on the prevention of the introduction of disease through the importation of live stock from foreign countries. Dr. Hickman's paper recited several instances, where surra, rinderpest and Malta fever had been stopped at quarantine through the careful work of the division of which he is chief.

Promptly at 1.30 p. m. the association adjourned to the Palm Room of the Jefferson, where an elegant banquet was served. We had as our guests the Hon. William Hodges Mahn, Governor of the state; Hon. J. Thompson Brown, chairman of the State Live Stock Sanitary Board; Prof. W. D. Saunders, State Dairy Commissioner; Hon. Henry C. Stewart; Dr. George Ben Johnson, of the Virginia Medical College, and Dr. W. Horace Hoskins, of the A. V. M. A. Dr. George C. Faville acted as toastmaster and introduced each of these guests, who responded in the happiest possible vein, and all of their talks were greatly enjoyed. A peculiar fact is that each of these speakers pressed home the lesson of the duty of personal service for the public good. Such influences as are represented by these men are of incalculable benefit to the profession.

After the banquet the election of officers took place and resulted as follows:

President, Dr. R. R. Clark, of Hampton, Virginia.

First Vice-President, Dr. J. S. Meyerhoffer, North River, Va.

Second Vice-President, Dr. H. Bannister, Roanoke, Va.

Secretary and Treasurer, Dr. George C. Faville, North Emporia, Va.

The Committee on Resolutions reported a resolution requesting the Attorney-General of the state to call the attention of the Commissioners of Revenue of the counties to the law regarding the issue of licenses to practice veterinary medicine in this state. A resolution was adopted, urging our senators to do all possible to secure the passage of the Army Bill by the Senate. After the usual votes of thanks to those who had helped to make the meeting such a success, the association adjourned, to meet in semi-annual session at Old Point Comfort, Va., the second Thursday in July.

GEORGE C. FAVILLE, Secretary-Treasurer.

COLORADO VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the above association was called to order by President Woodliffe in Denver, January 23, 1913, with a representative attendance, considering the small numbers in the state.

Dr. Dickey, president of the State Examining Board, made a rather extended report of the efforts of that board to drive out the non-licensed men from the state. It was stated that the results had been uniformly successful without necessity for legal action, except in one or two cases, and these were causing some worry, because of the fact that the men most vitally interested had very prominent political friends backing them. It was suggested that the probability is that in a very short time the cases would be carried to the Supreme Court so that we may know whether or not our law is of value.

The following officers were elected: Dr. A. B. McCapes, president; Dr. R. N. McCarroll, first vice-president; Dr. A. G. Fisk, second vice-president; Dr. I. E. Newsom, secretary-treasurer.

A very interesting program was rendered, an important topic of which was the discussion of the Kansas Horse Disease by Dr. H. Busman, of the Bureau of Animal Industry; Dr. G. H. Glover, of the Colorado Experiment Station, and Dr. C. V. Williams, a practitioner at Lamar, Colo., who had had wide experience in the vaccination of horses at the time of the outbreak in the Arkansas Valley.

All three papers were discussed vigorously, Dr. Busman taking the view of the Bureau, that all consideration pointed to the

cause of the disease as being forage poisoning; whereas Dr. Glover and Dr. Williams were inclined to the belief that forage poisoning did not explain all the phenomena, but that a microorganism was probably at the bottom of the difficulty.

"The Use of Serum in Hog Cholera" was the title of a paper given by Dr. J. F. Meinzer, of La Jara, Colo. Dr. Meinzer reported on something over 1,200 head of hogs to which he had given the "Serum Alone" method, with about 70 per cent. of recoveries. He stated that the disease with which he had been battling shows a chronic form and that in a number of herds the disease had existed for several weeks before treatment had been given. He was very strong in the belief that the "Serum Alone" method, where there was an outbreak in progress, was of advantage over the simultaneous method; however, he took particular pains to keep the sick hogs with the well ones for at least ten days following the injection of the serum.

This subject created a great deal of discussion, as hog cholera has been quite prevalent in the state.

The following resolutions of general interest to the profession were passed:

Resolution No. 1.—Resolved, that the Colorado Veterinary Medical Association is in favor of a federal constitution for the A. V. M. A., whereby state associations have voting representation therein and recommends the appointment of a committee to gather information thereon. Passed.

Resolution No. 2.—That none but graduate veterinary surgeons licensed to practice in the state of Colorado be allowed to conduct tuberculin and mallein tests. Passed.

Resolution No. 3.—Whereas, Only men who are graduates of recognized veterinary colleges are legally entitled to the title of "veterinary surgeon";

And Whereas, There are various positions in the state in which the law specifically provides for the appointment of a veterinary surgeon.

And Whereas, Under the Civil Service Law now in force in this state, the Civil Service Commission will in all probability hold examinations for such positions, be it

Resolved, By the Colorado Veterinary Medical Association in convention assembled, that the State Civil Service Commission be and is hereby requested to rule that in all examinations held by them in which the law provides for a position to be filled by a veterinary surgeon, only graduates of recognized veterinary colleges shall be eligible to take such examinations. Passed.

The next meeting will be held at Fort Collins during the latter part of May or the first of June.

Very truly yours,

I. E. Newsom, Secretary-Treasurer.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Augusta House, Augusta, January 9, 1913.

The meeting was called to order by President Wescott at 3.30 o'clock. As this was the annual meeting, there was a large attendance.

The minutes of the October meeting were read and approved.

The president gave his report. The reports of secretary and treasurer to be given at the next meeting; executive committee also to report at next meeting.

Dr. Salley gave a report of the clinic, which was held the day after the Skowhegan meeting.

The operation of trephining a horse with chronic nasal gleet (the discharge confined to one side) proved a success; at the end of eighteen days all discharge had ceased.

Election of officers resulted as follows: President of the association, Dr. H. B. F. Jervis, of Houlton; Vice-President, C. W. Purcell, of Biddeford; Secretary, H. B. Westcott, Portland; Treasurer, I. L. Salley, Skowhegan.

Reading of paper by Dr. H. B. Wescott. Subject: "Forage Poison in the Horse," giving the names of it in different states, also symptoms in the different stages of the disease, also giving treatment to a certain extent and preventive treatment. A general discussion by all the members present followed the reading of this paper. Dr. Lynch said they had an outbreak of "forage poison" at Portland, and he thought he could trace it to the mouldy feed, corn, etc.

Dr. H. B. F. Jervis was booked to read a paper at this meeting, but was not prepared.

New Business: The state board of veterinary examiners had a meeting and talked over the veterinary bill; the veterinary bill passed in 1905 was very good, but was repealed in 1907; the proposed new bill is to amend the 1905 bill.

The subject of testing cattle was discussed, the question being "How many readings of temperature should be taken be-

fore infecting the tuberculin?" This subject was discussed by all the members.

Meeting adjourned at 6 o'clock p. m. Banquet served at 7 o'clock p. m., Dr. G. F. Wescott acting as toastmaster. The banquet was a great success, for which credit is due the banquet committee. A good time was reported by all.

Adjournment at 10.15 p. m.

C. W. Watson, Secretary.

KENTUCKY VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this association was held at the Agriculture Building of the State University, Lexington, Ky., on January 7, 1913.

The meeting was called to order by President F. T. Eiseman at 10.30 o'clock. The regular routine of business of the association was then proceeded with, and the following officers were elected for the coming year: President, C. A. Miller, Louisville, Ky.; First Vice-President, Dr. S. F. Musselman, Cynthiana, Ky.; Second Vice-President, Dr. John T. Shannon, Lexington, Ky.; Secretary and Treasurer, Dr. W. B. Robinson, Mt. Sterling, Ky. Thirty members and four visitors were present at the opening of the meeting.

Dr. Robert Graham, of Experiment Station, Lexington, Ky., gave a practical and very interesting talk on "Hog Cholera, and Its Immunization and Treatment." It was followed by many questions and much discussion. Adjournment for dinner at 1.30 o'clock. The meeting was again called to order by President C. A. Miller, and the applications of new members were then considered. There were five applicants for membership, and four were accepted.

Dr. Robert Graham and Dr. Lewis McElyea, both of Experiment Station, Lexington, Ky., skillfully demonstrated to the association the vaccination of two pigs, weighing 60 pounds each. Each pig received 30 c.c. of serum and 2 c.c. of virus. This was followed by Dr. A. J. Payne's talk on sheep scabies and its eradication. After the discussion on sheep scabies the following papers were read: Dr. Jameson on "Symptomatic Anthrax," discussion by Dr. Jameson; Dr. L. M. Land on "Pneumonia and Its Treatment," discussion by R. P. Moody; Dr. F. T. Eiseman on "Tuberculosis," and discussion by M. A. Purdy.

This association is rapidly becoming stronger, the members binding together their original thoughts and scientific knowledge of veterinary medicine. We hope to become so organized that in the near future we will be able to secure a law that will put our profession on a higher base as a scientific profession and put the empirics to flight.

W. B. Robinson, Secretary.

KANSAS VETERINARY MEDICAL ASSOCIATION.

The ninth annual meeting of this association was held in Topeka January 7 and 8.

A good attendance was present and an excellent program was presented, which brought out much instructive discussion, besides the interesting subjects taken up by Drs. Kinsley, Maxwell, Kern, Shetler and other members of the association.

"The Fundamentals of Good State Live Stock Sanitary Control Work," by Dr. M. H. Reynolds, of Minnesota, was much appreciated and discussed. Dr. Reynolds pointed out how a live stock sanitary board, free from political fear or favor, is of inestimable value to the live stock interests of a state.

Resolutions were passed favoring the passage of the Army Veterinary Bill, and the secretary was instructed to send a copy of the resolutions to each member of the association and to the Kansas Delegation at Washington.

A resolution favoring President H. J. Waters, of the Kansas State Agricultural College, was also passed.

The following officers for the coming year were elected: Dr. J. F. Hemphill for president, to succeed Dr. W. N. Hobbs; Dr. C. B. Kern for member of executive board, to fill a vacancy caused by the expiration of Dr. Hemphill's term of office. Dr. J. H. Burt re-elected secretary-treasurer.

Twenty-three new members joined the association. The association members number five-sixths of the graduates in the state, which can be considered a good showing for the state association that began its career nine years ago with a membership of thirteen.

The association adjourned to meet at a time and place to be decided upon later by the Executive Board and notice of which will appear in this publication.

J. H. Burt, Secretary-Treasurer.

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