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VETERINARY REVIEW.

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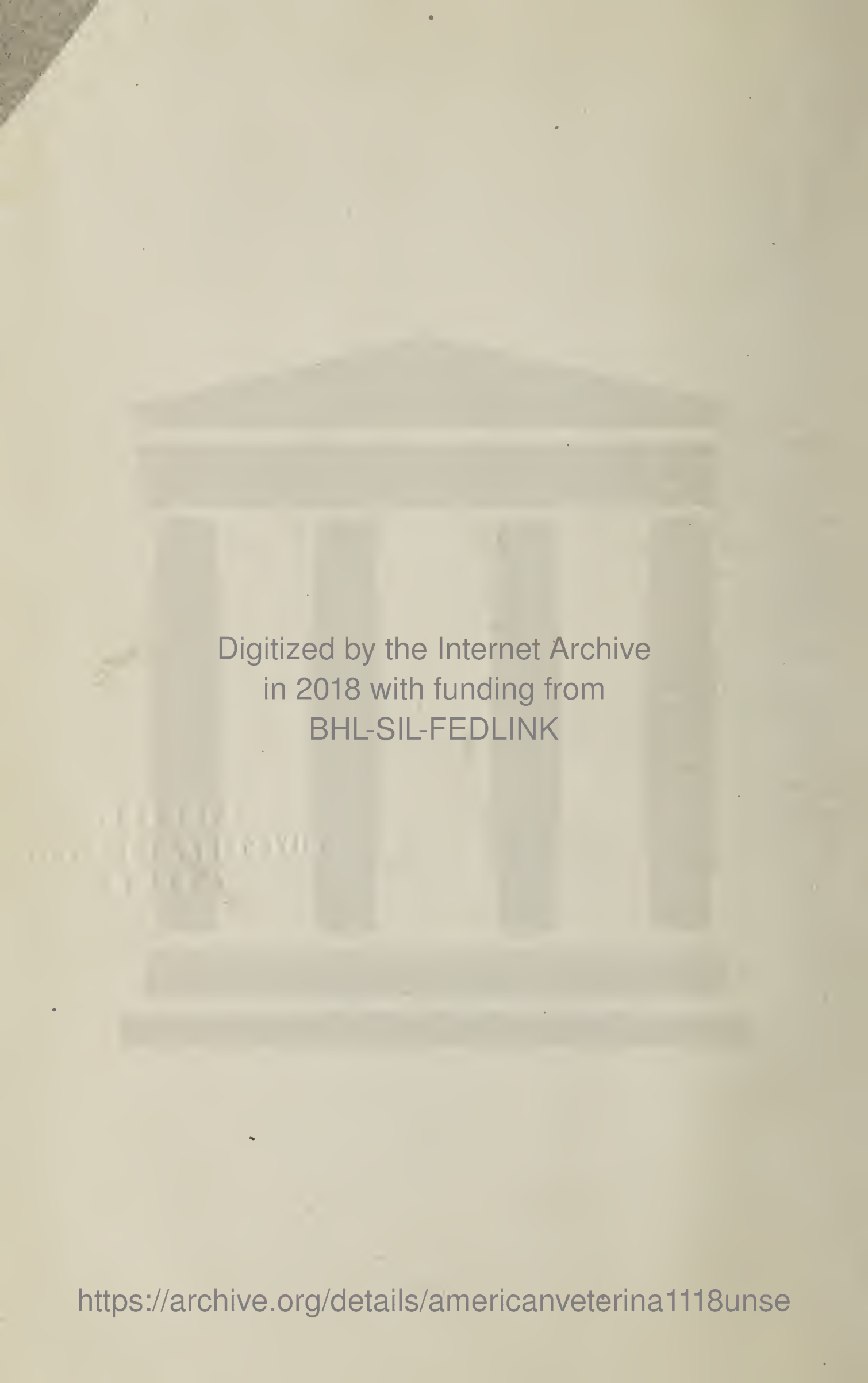

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AMERICAN VETERINARY REVIEW,

APRIL, 1887.

EDITORIAL.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.—Semi-annual meeting—Failure in former years; success in 1887—one of the largest audiences ever in attendance—good work of the committees—the success an evidence of the good that might be done—election of new members—amendment by Professor C. B. Michener—the association to be composed of graduates only—a timely action—enough begging for membership—that has been ignored—Massachusetts may have the first organization free from quackery, but the United States will in any case have the second—if not now at least in a few years. Action of various VETERINARY COLLEGES in relation to changes in educational training—caution necessary—difficult and delicate task. ARMY VETERNARIANS AGAIN—bill endorsed by the association—who asks for much may be content to accept less. CONTAGIOUS DISEASES—Dr. Salmon and Prof. McEachran present at the meeting—resolutions endorsing the Bureau of Animal Industry—down with political M.D's—no commission necessary to determine the character of the disease—another blow to inoculation—stamping-out process recommended—tuberculosis kills 125,000 persons annually—inspection of dairies and slaughter houses—recommendations to boards of health—veterinarians must be included in their staff. A competitive paper for the Prize of the Association and of the REVIEW—subject, Glanders—hope it will not prove to be a mere compilation—published now in sections, but will be issued entire hereafter—new subjects to be considered at a later period. Explanation to Dr. J. Gerth.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.—For a number of years past our new volume has opened with the report of the semi-annual meeting of the United States Veterinary Medical Association, and if we have not heretofore referred to

this meeting and its results with praise and approval it has not been through any fault on our part, but rather because, save in rare and exceptional cases, we have been unable to discover that it has been our duty to do so—a thing sincerely to be regretted. But, lest the casual reading of the report of the meeting recently held in Philadelphia should fail to convey an adequate impression of the character of that assemblage and the good results to be anticipated from it, we deem it but an act of justice to call attention to its proceedings with something more of emphasis and particularity than the mere current mention of the occasion. The session was held under the call of the Comitia Minora, and varied greatly from the custom of former occasions in proving to be an interesting and highly profitable meeting. A desire to inspect the progress achieved by the Veterinary Department of the University of Pennsylvania doubtless had some influence in drawing together a portion of the large number in attendance; but, aside from this, the arrangements were so judicious and the efforts of the various committees so well directed and so thorough, that no one can be surprised at the unwonted response which followed the roll-call. There seemed to be almost a concerted rivalry between the Eastern and Western constituencies in contributing to the representation and the consequent zeal and earnestness of the proceedings. We have attended nearly all the meetings of the Association, and with a single exception (that of the meeting of the Centennial year) we do not remember any other occasion so numerously attended, or when the work performed was ever so good and the membership so harmonious in spirit and sympathetic in feeling and purpose. The good that such gatherings might always accomplish, and the valuable results which might be secured, if the membership generally could but be brought to realize their duty to each other and to the community, are well illustrated by this meeting and its results.

The meeting of the Comitia Minora proved interesting, not only on account of the recommendation of a number of applicants for membership, but especially by reason of the notice given by Professor C. B. Michener of an amendment which he intends to propose, by which only regular graduates of veterinary medicine

shall be considered eligible to membership; a provision which will meet the unanimous approval of the Association. The time has fully come when the Association should make an effort to establish itself as the representative of the *regular profession*, and abolish the custom of begging for membership, which has already too long prevailed. This reform, if consummated, will place the Association second on the record of these who have adopted this wholesome and necessary policy, the Massachusetts Veterinary Association being the only one which thus far has held erect and firmly defended the standard of our profession.

At the general meeting a number of important reports were submitted by the various committees. One among these was in recommendation of a measure designed to secure a uniform standard of examination by the different veterinary colleges of the country. The resolution passed in response to the report of Dr. Hoskins will be read with interest. This is an important step and one which everyone will be glad to see properly acted upon, and is one of no great difficulty in execution, though requiring a great deal of moderation and deliberation in action. The varying relations which subsist among different colleges will, no doubt, interpose many minor difficulties in the way, and possibly special and peculiar interests may present themselves which may render the project exceedingly difficult to realize. May not the same remark apply to the motion made in relation to the endorsement by the Association of the bill for the improvement of the position and standing of our colleagues in the army? The endeavor to endow a veterinarian in the army with the rank of Colonel, in an army like that of the United States, is, we fear, a project which can hardly hope to command success when it is known that in some of the large European armies the grade of Major is the highest to which he can aspire. But who asks more may be pleased with less, provided it is an improvement at all. The subject of contagious diseases as they have prevailed in the United States could not be ignored, especially while the meeting was honored, as it was, by the presence of Dr. E. Salmon and Professor McEachran, and naturally enough tuberculosis and pleuro-pneumonia became the themes of a long and interesting

discussion. The resolutions relating to these maladies are too important to be merely referred to in the reports of the meeting. Those concerning contagious pleuro-pneumonia are in the terms following:

WHEREAS, Legislation in Congress on the subject of contagious pleuro-pneumonia has brought before the public the views of certain members of that body, in relation to that disease and our profession, which are not in accordance with generally received opinions, therefore be it

Resolved, That this Association does not consider it necessary to determine by any commission the specific character of that disease and its contagious nature, and that we heartily endorse the labors done by the Bureau of Animal Industry, and have full confidence in the fulfillment of its future work.

This resolution was undoubtedly intended to be an answer to the views of the two members of Congress who made themselves so conspicuous by their ignorance during the discussion of the Miller Bill. And again

Resolved, That this Association is convinced that inoculation for contagious pleuro-pneumonia is inapplicable and should not be adopted in the United States.

Resolved, That no animals should be placed in the infected stables until thorough disinfection has taken place.

Resolved, That all animals exposed to or having the disease should be destroyed.

The resolution relating to tuberculosis is also of great importance, and it is hoped that the committee having charge of the subject will see that there is no miscarriage in the attainment of the good it is expected to accomplish. It reads as follows:

WHEREAS, Tuberculosis is extensively prevalent throughout the country in both cattle and man, and whereas the consumption of meat and milk from tuberculous animals is the direct cause of a large proportion of the 125,000 human deaths which occur annually in the United States from tuberculosis; therefore be it

Resolved, That the attention of all Boards of Health throughout the country be called to the necessity of a rigid and competent inspection of all milk dairies and slaughter-houses.

Resolved, That all Boards of Health should have attached to their staff *qualified veterinarians* to carry on such inspection.

What more could be asked of such a meeting; is not this good work, and if to all that is added the reading of reports of

two very interesting cases from Dr. B. McInnes, Jr., and the usual notice of alterations of the by-laws, will not those who absented themselves from the session see cause for regretting their loss? The meeting was a good one, and the reception given by the Pennsylvania veterinarians to their colleagues on that occasion, especially by Prof. Huidekoper and his committee, was quite in keeping with the world-renowned hospitality of the Quaker City.

With the issue of this first number of our eleventh volume we begin the publication of a paper sent to us as that of a candidate for the prize offered by the United States Veterinary Medical Association and ourselves. The subject selected is very interesting, and, though it is one upon which volumes have already been written, we hope that the author will include in it something more than a mere general compilation of authorities. Some original thoughts or fresh investigations will, we anticipate, be presented. The paper, long as it is, promises to be one of the best of the competitive contributions of those elicited by the promised premiums. We are obliged to divide the article and to issue it in portions, but when completed we shall, in compliance with the requisition of the prize givers, have it printed entire and freely distributed for general reading and inspection.

Papers upon a number of new subjects will be found in the present number of the REVIEW, upon which we would like to offer special comment. Want of room for the present, however, compels their postponement to another issue. Some of these are of great importance, such as that of the Insurance Companies and that of the Registration of Veterinarians, as carried on at present in the State of New York. Members of the profession ought to keep watch of them and give their brethren the benefit of their varying personal thoughts.

We desire, in answer to a communication from our friend Dr. Gerth, to say that the remarks we made in our last issue did not apply to him, but to the person with whom his name was connected. We all know him too well ever to do him the injustice of placing him in the same category with his rival candidate for the State Veterinarianship of Montana.

ORIGINAL ARTICLES.

GLANDERS.

By Veterinarius.

A Contribution for the Prize offered by the U. S. Veterinary Medical Association for Papers published in the American Veterinary Review.

LITERATURE.—Billings—Relation of Animal Diseases to Public Health. Williams—Veterinary Medicine. Fleming—Veterinary Sanitary Science. Hirsch—Geographische Pathologie. Arbeiten, a. d. Kaiserlichen Gesundheits Amte 1886. Journal Comparative Medicine. Dieckerhoff—Pathologie u. Therapie fur Thierarzte. Zeitschrift fur Thier-medicin. Archiv. fur Thierheilkunde.

In a recent communication upon this subject I noticed that it was simply a repetition of former works and did not mention any of the latest investigations regarding the etiology of this disease. Within the last two years rapid strides have been made in tracing the etiology of glanders, and the diagnosis of chronic cases made almost a certainty, provided the veterinarian can make use of the latest scientific appliances. As none of those methods have as yet appeared in any of the veterinary journals * in this country, and as glanders is a source of great loss to horsemen in this country, I have written this communication in order that the latest and most expert means of diagnosis may be brought before the veterinary profession.

HISTORY OF GLANDERS.

That this dreaded equine disease was well known to the ancients cannot be disputed, as a great many writers have mentioned it; Apsyrtus, who lived in the 4th century, A.D., being undoubtedly the first. He described farcy as elephantiasis. Vegetius followed in the same direction in the next century. In the 13th century Rufus gave a fair description of the symptoms of the disease; he declared for its contagiousness, but considered it

* A most ridiculous attempt at noticing Loefler's work upon the etiology was made by one O'Leary in the January issue of the *Journal of Comparative Medicine.* One must really look upon it as an "Irish bull," and doubt if the writer of the notice ever read the original communication of Loefler's, as he certainly gives no evidence of having done so. He probably heard of it.

to occur in all manner of ways. In the 15th century Ruini held the same opinion. Winter von Adlers Flugel, a quaint German author of the 16th century, had many odd ideas concerning the nature of the disease. He describes it as occurring in two forms —"white," or stone glanders, which was curable in the earlier stages; and the other called "yellow," giving forth an offensive odor and incurable.

From the latter part of the last century there has always been an active controversy as to the genesis of glanders, one school affirming it was purely contagious, another admitting its contagiousness, but affirming its genesis to all sorts of circumstances. These two opinions still oppose each other, but those affirming the abiogenetic or spontaneous generation of glanders are gradually becoming less and less. At this present day there are still many advocates of its spontaneous generation both in France and England. Of modern English authors, Professor Williams and Dr. Fleming are the best known. Dr. Fleming, in his "Veterinary Police," speaks of glanders "as a special diathesis peculiar to the equine species." Now, glanders is not a "*diathesis.*" Diathesis is derived from the Greek to "dispose," and the word means a peculiar condition of an organism, predisposing it to certain diseases, as scrofula disposes to tuberculosis. Glanders can be spoken of as a "dyscrasis." Logically, it cannot be applied to that peculiarity of the different animal species by which certain diseases originate in them primarily, or only in them. We cannot speak of a measles diathesis, or a rinderpest diathesis, any more than of a glanders diathesis. A diathesis is something inherited or produced. It is a weakness causing a tendency to secondary complications.

Acute glanders has been occasionally supposed to be merely the expression of purulent infection in the equine species, from the frequency with which it has been observed to follow severe operations, purulent fevers, or inflamed blood-vessels. Glanders is not a purulent affection, and when appearing under any of the above circumstances, was either present in a latent form prior to their occurrence, and they acted as the *causa sufficiens*, or the animal acquired it after either of the above conditions were produced.

GEOGRAPHICAL DISTRIBUTION OF GLANDERS.

Glanders is fast becoming a cosmopolitan disease. If the march of an empire makes its way westward this disease accompanies it. In civilized countries the extension of all contagious diseases bears direct relation to the intelligence of the Government in taking means to suppress them, and the frequency of the ease of travel and intercourse. Glanders has followed the same course.

At one time it was said not to prevail in hot climates; but it has acquired an alarming extension and breaks out at the different cavalry stations of the British forces in India, and other tropical countries. But where there is little or no intercourse with other parts, as in Iceland and other Northern countries, there is little or no glanders. This led to the assumption that it did not thrive in such a climate, and that it steadily increased as we proceeded from the North to the South, until we arrived at tropical limits. This is all wrong; the occasions to infection, with lack of sanitary police, being given, glanders will appear as frequently in one climate as another.

In this country glanders has become much more prevalent since the war. After the Franco-Prussian war glanders increased in Prussia (reported cases) from 959 cases for 1869–'70, and 996 for 1870–'71, to 1,729 for 1871–'72 and 2,058 for 1873–'74.

Glanders is also known in North China, and is of frequent occurrence at the Cape of Good Hope, and it is also prevalent in Honolulu, Sandwich Islands.

THE NATURE OF GLANDERS.

In speaking of any disease it is very necessary that both professionals and the public have an exact idea as to its true character. In this sense glanders is a *strictly contagious disease;* it arises by contagion only, that is, by contact either with a previously diseased animal, or with material from such an animal. 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.

TRANSMISSION OF GLANDERS TO OTHER SPECIES OF ANIMAL LIFE.

Glanders also occurs in the ass and mule, and is also transmissible to man and all the domestic animals, *except to cattle.* Sheep are especially susceptible to infection. Goats have acquired the disease when kept in the same stables as diseased horses. The disease has been observed and intentionally produced in dogs, cats, prairie-dogs, white bears, lions, mice, guinea-pigs, rabbits, and, according to Gerlach and Spinola, the hog also, although no generalization of the disease appeared to take place in them.

PHENOMENOLOGY OF GLANDERS.

According to duration, glanders may be spoken of as *acute* or *chronic.* According to seat as *nasal*, *pulmonary* or *cutaneous* glanders; (farcy is also divided into *acute* and *chronic.*) Chronic glanders is the common, acute the rarer form.

INCUBATION AND DURATION.

By inoculation, from three to five days.

By natural infection, indefinite, the authorities varying from five to six days to as many weeks. In chronic glanders a period of apparent latency may exist for months, but even here there must be a period of incubation. Acute glanders may terminate in fifteen days, while the chronic form may continue for years; how many is an open question. Dieckerhoff mentions a case in which the disease was known to exist for a period of seven years. Chronic glanders invariably terminates in acute, but when acute follows known infection it never assumes a chronic form.

THE MANNER IN WHICH INFECTION OCCURS.

The infection gains access to a susceptible organism either by means of superficial wounds or excoriations, or through the digestive or respiratory tracts. In rare cases the disease may be transmitted by copulation. The bacilli do not appear able to penetrate through the uninjured skin or mucosa. The greater number of cases of farcy must be due to injuries in the skin. The views of authors differ greatly as to the possibility of infection by means of the digestive tract. Professor Williams says that "farcied matter made into balls and introduced into the stomach of a horse

has caused glanders." This question can only be satisfactorily settled by feeding susceptible animals with large quantities of purely cultivated bacilli, and the careful control of the same by inoculative experiments.

Infection through the respiratory tract is of far more importance, as it is well known that germs can penetrate to the most delicate ramifications of the bronchioles, as has been shown by numerous inhalation experiments with desiccated tubercle bacilli and other material.

The statistics that have been gathered from necroscopical examinations of glandered horses have shown numerous cases in which the lungs were the only organs visibly affected, or that the oldest phenomena were present in them. Inhalations with purely cultivated glanders bacilli have not yet been made.

It is an unquestionable fact that glandered mares have given birth to colts with the disease, that is, that the bacilli can pass from mother to fœtus; similar observations have been made with guinea-pigs.

THE ETIOLOGY OF GLANDERS.

Glanders, or better, the glanders-farcy disease, on account of its serious effects upon the agricultural interests of mankind, has been energetically combated on all sides. Past experience has demonstrated the uselessness of all medicines to cure or prevent this disease; hence it is but natural that every attempt should be made to prevent its eruption and extension. Therefore it becomes necessary that we should gain all the knowledge possible with reference to its etiology or cause.

Observations led to the conclusions that glanders was very common among horses that were kept in narrow, damp, ill-ventilated stalls, and under such circumstances often assumed a very malignant character; but closer and more thorough examination pointed to the fact that the very best hygienic conditions were not, in themselves, sufficient to prevent an outbreak of glanders when a diseased horse chanced to come among them, and that the disease extended from animal to animal, and unfavorable hygienic conditions were simply important aids in the extension of the disease.

It is remarkable that the earlier writers should have entirely overlooked the contagious nature of glanders. Neither Hippocrates, Aspyrtus or Vegetius mention such a thing as contagion. The idea of contagion seems to have first impressed itself on man's mind in the 17th century. The first positive assertions are to be found in Solleysel, 1664, who spoke of it as a contagious disease easily transmissible from horse to horse, even by means of air in stables where a diseased animal was kept among healthy ones. In 1734 Gaspard Saunier agreed with the views of Solleysel, and gave very distinct regulations for the disinfection of stables in which glandered horses had been kept, such as the removal of cribs and racks and renewal of the plastering. In 1741 Garsault advised the immediate slaughter of the diseased, and strict isolation of suspected horses, in order to put an end to the outbreak. Towards the end of the 18th century it was the prevailing opinion that glanders was a contagious disease; still, absolute proof was wanting. This can only be had by direct experiment. Endeavors in this direction were made by Abildgaard and Viborg in Denmark, and Blaine in England, who were successful in producing glanders in horses and asses by inoculation with the nasal secretion of glandered horses. At this time in France there began a powerful reaction against the teachings that glanders was a contagious disease, and this did not abate until 1837, when Rayer brought before the Académie de Médecine the most convincing proof of the transmissibity of glanders to man, when its contagious character again gained credence.

In Germany most of the great authorities had always been in favor of the contagious character of glanders. In 1841, Dr. Schilling gave sufficient evidence of the transmission of glanders to human beings. In 1835, regulations were issued treating the disease from this standpoint, and contained a very minute description of its course in man. The contagious nature of glanders gained general adoption as a scientific fact, but the world was still in the dark as to the real nature of the infecting agent. All observers agreed in considering the nasal secretion of glandered horses as the vehicle by which infection was made possible. In 1841 Berhard Langenbeck made an exhaustive examination of

the nasal secretion of a glandered horse and found "the transparent thallus of a mycelial fungus, and numerous masses of reddish-brown streptococci;" this observation was undoubtedly correct, but the organisms owe their origin to the food, and can be found in the nasal secretion of almost any horse, and, therefore, they cannot have anything to do with the cause of glanders. During the next twenty years no similar observations were recorded. Virchow, in his classical studies on the pathological anatomy of the neoplastic production in glanders, says that one must look upon the contagion as of an acrid or irritative nature, whether it worked from the blood or directly upon the tissues. In 1868, several new works appeared upon this question.

Chauveau stated that the inficiens (or infecting material) of glanders was contained in the solid elements of the infecting or infectious material; in his work he gave an exhaustive description.

He took 10 c-c-ms of pus from the pulmonary abscess of a glandered horse and diluted the same with 200 c-c-ms of water. This mixture was frequently stirred up and filtered so that nothing was left but the solid elements. He then mixed the latter with 500 c-c-ms of water and allowed it to stand over night. The fluid was then gently removed with a syphon and the refuse at the bottom of the vessel again diluted with another 500 c-c-ms of water and allowed to stand another night. This water being removed as before, still another 1,000 c-c-m's of distilled water was added, the mass being again stirred up and then filtered, the solid element being then mixed with very little water. The inoculation of several horses and donkeys with this solid material was followed by the eruption of glanders in four days, while similar experiments made with the last filtrated water gave negative results. Chauveau drew the following conclusion from these experiments: "That the leucocytes (or white blood-cells) suspended in the virulent fluids may be considered as the receptacles of the virus," which later observers have confirmed.

Hallier and Zurn conducted numerous investigations, but neglected to confirm their conclusions by inoculation experiments with horses. Semmer, of Dorpat, confirmed the conclusions of Zurn and Hallier, but his experiments gave negative results.

In 1869, Christot and Keiner presented a communication to the Academy at Paris. They had had an opportunity to study glanders in man, and successfully transmitted the disease to horses, cats and guinea-pigs; they found a form of lower organism both in the blood and other products, even in cases of chronic glanders. The size of the objects they saw was as follows: the smaller had a diameter of 0.0012 mm., the larger had a diameter greater than the above. If objects as the above were so prevalent in the blood and pathological products in glanders, and so easily seen, then other microscopists must have seen them, but this has not been the case. Rindfleisch also reported the presence of bacteria in glanders. Roszahegyi reported a special bacillus in the tissues of a man that died of glanders which differed from the Bacterin Termo in form and being immovable, but did not give any proof of its casual connection with that disease.

In order to prove that a specific micro-organism is the cause of a certain disease, it is necessary that it conform to the three postulates of Robert Koch:

(1.) One and the same micro-organism must be constantly present in the diseased portions of the same individual and all individuals having the same disease.

(2.) This foreign organism must be isolated from the tissues of the diseased individual, and cultivated by itself as an independent individuality through many generations until we arrive at a constant purity in our cultivations.

(3.) The same disease in all respects must be produced by the inoculation of susceptible individuals from such pure cultivation.

To accomplish this, place small pieces of the organs of horses that have been immediately killed on account of glanders in absolute alcohol; especial attention must be given to the selection of material that did not stand in relation with the external world during the life of the animal. Hardened lung-tissue carefully cut into thin sections with the microtome, and then subjected to various methods of coloring; on account of the great resemblance between glanders and tuberculosis it was first necessary to try the method that has acquired a specific value in connection with the bacilli of the latter disease; no satisfactory results followed, as

was also the case in using Weigert's gentian-violet picro-carmine method. Numerous other methods and many coloring materials were also tried, but with no satisfactory results. Methyl-blue was the only material that gave any hopes; it was used as follows: 30 c-c-ms concentrated alcoholic solution of methyl-blue, 100 c-c-ms of kali causticum, 1 to 10,000 of aqua. Place sections of tissue in the above solution for about five minutes, and then wash quickly in a solution of 1 per cent. acetic acid, then in absolute alcohol, then in cedar oil, and mount in Canada balsam, which should not be dissolved with chloroform, but with xyol or turpentine for all aniline colors. Careful microscropic examination of sections treated as above will show the presence of very delicate bacilli in the peripheral portions of glanders noduli, which bear a very strong resemblance to those of tuberculosis; they could not be putrefactive bacteria, as the organs were hardened when perfectly fresh, and their presence was limited to the noduli and not scattered indiscriminately over the specimen. The small number present, and the fact that they were entirely wanting in some specimens, did away with any doubt regarding their genetrical connection with the pathological products. As the coloring method did not allow of any positive conclusion as to the value of these bacilli, the investigators had recourse to other methods.

Cultivation is undoubtedly the most satisfactory method of demonstrating the presence of micro-organism in a tissue or organ. By this method Strauss and Chamberland in inoculated anthrax were able to demonstrate the presence of anthrax bacilli in the blood of fœti of pregnant guinea-pigs, in direct contradiction to the microscopic experiences of all previous observers.

On the 14th of September, 1882, Dr. Loeffler commenced his experiments. In order to render them as certain as possible, he had recourse to a very large selection of cultivating media, such as sterilized and solidified blood serum drawn from the horse and sheep, infusions made from the flesh of horses, rabbits, hens, cattle and man, as well as various vegetable substances.

To prevent the pieces of the organs used for cultivations becoming polluted, they were placed in a vessel containing a 5 per cent. solution of carbolic acid for five minutes, and then put in a

1 per cent. solution of corrosive sublimate, then placed on a clean glass plate. The hands of the operator, as well as the instruments, were disinfected before use. Great value could be placed upon cultivations from the liver and spleen, as the accidental pollution of their interior was almost impossible under such circumstances. A section was made in the vicinity of a glanderous nodule, and then another down on the same with a fresh knife, but not into it; the node was then seized with sterilized forceps and torn apart; the purulent material in such a growth thus escaped contact with any instrument, and was immediately inoculated upon the various media by means of sterilized platinum needles, a fresh one being used in each case. Seventy cultivations were made and placed in a thermostat having a temperature of 38° C. During the first two days no important changes occurred; on the third day they became clouded with the exception of that made from the juice of stewed prunes. The surface of the consolidated blood serum became covered with numerous transparent drops having a yellowish color, giving the surface of the serum the appearance of having been sprinkled with some fluid; the majority of the tubes contained nothing but these drops, but in a few some isolated non-transparent white or yellowish colonies appeared, easily distinguished from the yellow drops, and gave the impression that they were of a pollutive nature or accidental occurrences. A microscopic examination of the yellow transparent colonies revealed the presence of very fine delicate bacilli corresponding in all essentials with those found in sections of the pathological neoplasms of glanders. The same bacilli were found on all the cultures except the prune juice infusion. An occasional tube was found polluted with a micro-organism of another form and character. Some tubes inoculated with material from diseased lymph glands had development of colonies. The bacilli varied very little in length, some being between one and two-thirds the diameter of a red blood corpuscle; they were straight or very slightly curved, being somewhat shorter and thicker than the bacillus of tuberculosis. The bacilli generally occurred in lateral pairs. When examined in some cultivating medium suspended in a hollow object-glass they exhibited a very active Brownian movement, but idiosyn-

cratic mobility was not observed. In such a fluid the rods appear thicker and shorter than in cultures upon blood serum. The development of this heretofore unknown micro-organism, so characteristic in the different media, and the fact that the cultures were taken from seven different glanders noduli, thereby justifies the hypothesis that these bacilli are the real etiological moment in glanders.

(*To be continued.*)

EPIDEMIC VARIOLA IN SHEEP.

By G. Archie Stockwell, M.D., F.Z.S.

Recently was brought to my knowledge the fact that in the early part of the present century the flocks, herds and stables of America were ravaged by an epidemic of that foul disorder, the small-pox—from 1809 to 1820. Indefinite as is the history thereof, there is much that is of value. Every epidemic presents two factors for consideration—the relations of the malady to its victims directly, and its relations indirectly to creatures of another race, including man. In this connection it would be interesting (as well as of value) to know: Whether this epidemic—which attacked sheep, cattle and horses alike—arose coincidently among all three; what were the exact evidences of contagion aside from direct infection, and whether its appearance in any one race influenced its rise among others. Here are involved physiological and pathological problems that are greatly mooted and very little understood further than the limited knowledge that accrues to the relations of *variola bovina* and *variola humana:* unfortunately, no satisfactory data are obtainable. One fact was evolved, to the satisfaction of the laity, if *not* of the medical profession, that the disease as contracted by man from all of these three forms of animal life afforded a degree of protection from the contagion of *variola humana;* and a venerable gentleman of my acquaintance, a life long farmer, who yet exhibits upon his hands and wrists the scars obtained in boyhood from this very epidemic, and from *sheep*, as he insists, has ever remained proof against small-pox and

attempts repeatedly made to secure an inoculated *vaccinea*. His duties were such that the flocks became his especial care, while the cattle and horses fell to the lot of others, his elders; and the sheep necessarily demanded repeated handling, his waking hours being almost wholly passed among them; hence the contracting of a *variola ovinæ*.

In gathering material for a paper upon the relations of animal diseases to man, through the favor of a friend in Boston I have been put in possession of a copy of a letter relating to this epidemic as it appeared in *sheep* during the year 1810–'11, written by Dr. Thomas Thaxter, of Hingham (Mass.), to Hon. James Bowdin, of Boston, which is of such interest that I venture to lay a digest thereof before the readers of the REVIEW. The disease was first observed by him among a flock of merino sheep recently imported from Portugal, and "was as distinctly marked as in man."

Three forms of the disease were observed, which Dr. Thaxter classifies as "*distinct*, *confluent* and *purple*." The infection was communicated from one to another in the same manner as with human beings—"from coming within the atmosphere of each other at an advanced stage of the disease (at which time they have a peculiar odor), from being enclosed in the same pen, or from feeding from the same utensils that had previously been used by sick sheep without cleaning."

The disease first discovered itself "from the twelfth to fifteenth day after receiving the infection." The symptoms of those with *variola purpura* succeeded so rapidly that it was difficult to distinguish one stage from another; but all were very much swollen about the body, and respiration soon became slow, labored and difficult. Such died early, exhibiting the dark, grumous condition of integument so frequently observed in man under like circumstances and conditions.

Confluent and *distinct variolas* appeared more marked and afforded better opportunity for observation. At the outset of the attack each animal inclined to avoid the society of its companions, seeking retired places in the yard, and the mouth and tongue worked incessantly, as if tasting something bitter or un-

palatable. Though not inclined to ruminate, none refused food wholly. Soon each began to rub its head against the fence or wall, and about the same time a discharge from the nose appeared, very like the first symptoms of a coryza or cold; the eyes were swollen, the ears drooped, the head hung down, and the body generally was drawn up with indications of acute suffering. In three or four days (occasionally not until the fifth or sixth) they pretty much refused food, and appeared to suffer with sore mouths and throats, so much so as to interfere with mastication and deglutition. In the meantime excessive thirst was apparent, though if allowed more than a pint of water at a time considerable distress was manifested.

An examination of those with *confluent variola* discovered spots on the skin varying in size from a half dime to a dollar, with an appearance like *herpes circinatus*, but without inflammation; but these contained no fluid, even though the sheep survived to the ninth and tenth day. At this advanced stage of the malady the nostrils poured forth copious mucous discharges, sometimes white, but more frequently tinged or streaked with yellow.

The symptoms manifested by those with *distinct variola* were much the same as the foregoing at the outset, but less in *degree*. The third or fourth days the pocks could be distinguished as hard, prominent pustules, situate for the most part between the shoulders and breast, upon the udder, and on the tail. After a lapse of three or four days these pustules became flattened, and contained so small a quantity of fluid that it was seldom possible to secure more than a single drop where several might reasonably be expected; the pustules afterwards produced a dark scab, which lingered a number of days before separating, and wherever found upon the animal induced the fleece to fall.

A few had the *distinct* form mildly, after three or four days would ruminate occasionally, and seemed to have exacerbations of the disease which were manifested by uneasy, restless movements, as if in pain. Several, while the disorder was in progress, and others after it appeared to have subsided, were taken with paralysis of the extremities; and lambs, more especially, were

prone to such attacks, which, in them, oftentimes was the first manifestation of illness. Throughout the disorder all exhibited great tenderness or soreness of the skin and sensibility to handling, shrinking every time the fleece was touched. During the last stage they frequently huddled together as for warmth.

Several modes of treatment were tried, including bleeding, purging with neutral salts, administration of castor oil, senna, and *thorowstock** and glysters. In some instances, where the creatures were markedly costive, these remedies gave temporary relief, but no more; but in general the alvine and urinary evacuations were passed without artificial aid. Blisters also were applied between the shoulders and breast, and onions to the throat, and water-gruel given along with infusions of mullin, saffron, juniper, etc., with injections in the nasal passages of vinegar and oil to promote discharges therefrom. But no satisfactory or permanent results were had from any of these efforts.

A merino ewe, imported in November, lambed on the 27th of January, with healthy offspring and good udder of milk. On the 30th, twelve days after being isolated from her diseased companions, she exhibited signs of indisposition, and soon refused to nurse the lamb, though her bag was hard and swollen, as if overdistended with milk. The lamb died February 6th, the mother the day following—twenty-one days after being exposed to infection.

In February the disease was first discovered among the native sheep. Nine out of twenty-two ewes were taken within two days, six of which died—one in twelve, one in thirty and one in forty-eight *hours*; the other three lived nine, sixteen and thirty *days* respectively, the last succumbing only after losing both eyes. An autopsy of the last two revealed a suppuration near the base of the heart in the first, and purulent infiltration of the lungs in the second—a condition found to have occurred in a number that survived the first ravages of the malady only to succumb to subsequent and secondary influences, exhibiting either ulceration of

*Probably *linseed* or *linseed oil*, which sometimes obtains this designation, though formerly a cathartic bolus of many and wondrous ingredients was known by this title.

the lungs or hydatids of the liver, or both, and tubercular deposits throughout the body, formed both with serum and with pus.

The first endeavor to check the disorder was to separate the well from the sick, placing the former in non-infected barns. But whether the man who had them in charge conveyed the infection from one barn to another in his clothing, or carelessly employed the utensils set apart for the infected sheep in which to feed the sound ones, is not known. It was supposed a stop had been put to the ravages of the disease when the sound sheep had been isolated from those infected for more than fifteen days without indications of disease; but all at once four new cases were perceived, three of which terminated fatally on the fifth and ninth days. During this time two ewes had the *distinct* form of *variola* so mildly as to pass unperceived had not accident drawn attention thereto. These were removed from the others, as it was thought, before they had opportunity to communicate the malady, for it was expected all attacked would die, being near the time of lambing.

At this point virus taken from the pustules of infected sheep was employed to inoculate the sound ones, though with little hope of favorable result; some had lambed just before inoculation, the remainder soon after. The lambs, too (twelve in number), as fast as they appeared, were inoculated on the third or fourth day. All, lambs and adults, took the disease mildly, and recovered readily, with no untoward results, and subsequently proved the healthiest of sheep, though nothing more was done for them than to provide suitable diet and an abundance of pure, fresh air. Save in a single instance, the disease, as the result of inoculation, manifested itself only for two or three days, after which they ate and ruminated naturally and freely. Some would never have been suspected of *variola* but for the inoculatory incisions, that contained good, *viable* pus, or from the discovery of the few pustules that appeared here and there, isolatedly, after a few days.

The exception above noted, the one longest and most affected, exhibited indirect inflammation at the point of inoculation, with a

tendency to sphacelation rather than suppuration. The remainder gave evidence of the disease by the formation of pus in the incisions on the second, third and fourth days, so that several drops could be collected daily for some days, and those earliest affected throve the best.

The appearances as enumerated lead to the conclusion that a typographical error occurs in Mr. Flagg's work, which was recently perused, as it is there stated that an inoculated small-pox appears in *two* days, while that of contagion is delayed from *fifteen* to *thirty*. Except pus found in the incisions of the former, in no instance was the disease made manifest before the *eighth*, *tenth* or *twelfth* day, nor did the eruption appear to form a *crisis* earlier; and many of the sheep ate, ruminated and nursed their lambs through the whole period of the disease, only two or three appearing at all ill, and only for as many days. As the result of contagion the disease was never delayed *more* than fifteen days before discovering itself by the usual symptoms, and, though in general the pustules of the *distinct* form were found thus early or earlier, the animals would remain ill fifteen or twenty days longer, and not appear wholly well or thriving for thirty or forty days more.

It is singular that, no matter whether the disease was taken by inoculation or contagion, in no instance did a ewe cast her young, not even in the most virulent cases, *confluent* or *purple*. In two instances, where lambs were prematurely cast, both could be traced to incautious handling, they being gravid with triplets; neither did the disorder affect the supply of milk, unless the sheep had been reduced and run down previous to lambing. There was less disposition to the formation of fluid within the pustules than in the human subject. And the lambs, on handling, were found to perspire very freely beneath, especially in the vicinity of the groins, while the testicles were more or less swollen. No opportunity was had of examining an old male, all under observation being ewes, in which no differences were discovered, whether nursing, gravid or barren.

* * * * * * *

Apropos of the foregoing, which would seem to inculcate

principles worthy of note, even at this day, including immediate inoculation, no matter what the season, condition of sheep, etc., on the breaking out of an epidemic, I recall the suggestion made by my friend Dr. John Hjaltelin regarding infectious and contagious disorders as occurring both in animals and men; and, from his long experience as Medical Inspector of Iceland, no one is in better position to know, since small-pox and typhus frequently run riot in that bleak corner of the world. In all epidemics, of whatever nature or class, he recommends the *free and lavish use of disinfecting fluids as of untold value in limiting and opposing their progress by contagion.*

Sheep kept in barns, while plenty of fresh air is possible, may yet be subjected to the influences of disinfectants in solution, especially such cheap and effective agents as chlorine and bromine waters. A solution of zinc chloride or muriate of lime sprinkled about is all sufficient if dispensed with no sparing hand, and the free use of charcoal in coarse powder is also advisable. Such will not only destroy the odors so characteristic of epidemics, but further render the germs (whence the odor) innocuous. Phenol is objectionable because of its volatile nature, and bi-chloride of mercury solution, owing to its excessively poisonous nature. The renowned Dr. Eisenmann, of Germany, used chlorine-water for this very purpose with most satisfactory results; and if, in the close turf cabins of Iceland, where ventilation is impossible—where families of a dozen or twenty are crowded into one small room but ten to twelve by six, oftentimes, sleeping in reversed order of heads, like sardines packed in a box—such simple method can limit the infection of malignant typhus to a single patient in any one habitation, as is *known* to have been done, the value of complete and thorough disinfection in incalculable and immeasurable.

When epidemics rage violently, there always appears a peculiar condition of the atmosphere of the neighborhood, perhaps due to high barometric pressure, perhaps to want of electric tension, which would lead us to believe that, after all, there is something in the *constitutio æris adynamica* of our fathers, supposed to originate malignant disease, though doubtless bad "air-constitu-

tion" is only a sequel or co-efficient cause aiding in the propagation and dissemination of seed already sown. And this can only be overcome by *true* disinfectants and germicides—not substances that merely replace one foul odor with another still *worse*.

PORT HURON, MICH.

HOG CHOLERA.

A SURE MEANS FOR THE PREVENTION OF THE DISEASE DISCOVERED.

BY FRANK S. BILLINGS, V.M.

SECOND ANNOUNCEMENT OF THE WORK DONE AT THE EXPERIMENT STATION OF THE STATE UNIVERSITY OF NEBRASKA FOR THE STUDY OF CONTAGIOUS AND INFECTIOUS ANIMAL DISEASES.

LINCOLN, NEB., Jan. 22, 1887.—To the Board of Regents and the Chancellor of the University—Gentlemen: Herewith please find my second, and the most important announcement of the work done under your auspices. I think that you have no reason to be disappointed, as we only began working July last. While much remains to be done, in a strictly scientific sense, we need to make but one large test experiment in order to turn the question of the prevention of swine plague by inoculation over to the State authorities. I will not attempt to thank you for the constant trust and support you have given me, as well as your co-laborers of the board of regents, because I cannot, but will rather endeavor to show my gratitude by future work.

TABLE OF EXPERIMENTS.

1. Six month old hog sick with swine plague (recovered)
2. Six months old hog recovered from swine plague last winter (no effect).
3. Six months old hog sick with swine plague, died.

} Penned together.

4. Six months old hog recovered from swine plague last winter, no effect.
5. Three months old hog in pen with No. 4 after 3 had died, no effect.
6. Three months old hog inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, died July 25, '86.

7. Three months old hog inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, died Aug. 1, '86.
8. Three months old hog inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, died Aug. 7, '86.
9. Three months old hog inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, recovered.
10. Same as No. 2, inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, no effect of consequence.
11. Same as No. 4, inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, no effect of consequence.
12. Same as No. 1, inoculated with culture from Mr. W's pig (of July 8, '86) July 20, '86, no effect of consequence.
13. Another pig same lot as Nos. 2 and 4 inoculated with same material, no effect of consequence.
14. Healthy pig inoculated with tenth generation of same material as 6 to 13, Sept. 28, died Oct. 13, '86.
15. Healthy pig inoculated with third generation of material from Rising, Neb., Sept. 28, died Oct. 7, '86.
16. Healthy pig inoculated with third generation of material from Rising, Neb., Sept. 28, recovered.
17. Healthy pig inoculated with third generation of material from Rising, Neb., Sept. 28, died Oct. 15.
18. Healthy pig inoculated with third generation of material from Rising, Neb., Sept. 28, died Oct. 16.
19. Healthy pig inoculated with third generation of material from Rising, Neb,, Sept. 28, recovered.
20. Healthy pig fed with potato culture of same bacteria Oct. 23, no ill effects.
21. Healthy pig inoculated with three grammes boullion culture from spleen of sick pig Oct. 27, died Nov. 17; lesions very marked.

22. Same as No. 2
23. " " 4
24. " " 13
25. " " 19

Inoculated with 5 fl. grammes of a pure boullion culture from the Rising outbreak, which killed rabbits in four days. Some swelling and heat at point inoculated, and lameness. No other evil effects.

26.
27.
28.
29.
30.
31.
32.

Healthy pigs 6 mos. old.

All raised at college farm from sows that had had the swine plague the previous winter and recovered. Each inoculated with 3 fluid grammes of a vaccine on the 14th of November, '86. Somewhat off feed for a few days. Heat and swelllng at point inoculated.

Again inoculated with the same material on Nov. 27, '86. Appetite not much affected. Some swelling and heat at points inoculated.

The above experiments show that the hogs which had the swine plague could not be reinfected by inoculation, nor by contact nor by pen infection, as they were not only placed in the

pens with sick hogs, but also in the same pens with the pigs killed by inoculation with pure virus.

The next question was to expose these hogs to natural infection in the most extreme manner possible. A most severe outbreak of swine plague at the farm of a Mr. B. near Lincoln offered not only a fitting opportunity, but the severe snow storm of November 17, in which my test hogs were snowed in with a large number of sick, and a dozen or more dead hogs, added to the severity of the test.

EXPERIMENT.

Five hogs that had had swine plague the previous winter at the college farm, four of which had been repeatedly tested as mentioned above, and one which had not been so tested, as well as Nos. 26 to 32 inclusive, and two non-treated pigs, (test pigs) were sent to the place mentioned. Fourteen in all.

The results of this experiment were not as satisfactory as could be wished for various reasons.

First.—The smaller pigs were rather fine quality, and four of them were either stolen or run over by the cars which went close by the field where the sick drove was, and the wire fence did not keep the smaller ones in.

Second.—The two test pigs and one vaccinated pig died of the swine plague or of the storm, but had the lesions of swine plague; they were found covered with snow and frozen stiff, so that an autopsy was made at some inconvenience. Cultures grew from the spleen and mice succumed to the cultures.

Two of the inoculated pigs, being small and somewhat weak, died the second day after their return to the college farm from general exhaustion. No lesions of consequence; nor were bacteria to be found in them either by examination of their blood with the microscope or by cultivations.

Fourth.—The five hogs from the college farm that had the swine plague, and been already severely tested, as well as the one from the same lot that had not been so tested, went through this exposure to infection and storm without any visible ill effects, though exposed for twenty-three days, and have remained well ever since.

The result obtained then had only this value: It completely demonstrated that the majority of hogs that have been through swine plague from natural infection will not have the disease a second time, even after very severe tests, and therefore that prevention by vaccination is possible.

With regard to the two inoculated pigs that died from the effects of exposure, I will claim nothing, but will mention that the Hon. S. W. Burnham, senator from Lancaster, who so kindly placed the infected herd at my disposal to do anything I pleased with, remarked "that those small pigs will not live anyway if severe weather comes on." I also vaccinated some forty of Mr. Burnham's hogs, and very severely; those hogs came through and have since thrived better than any other hogs on the place. Whether this fact was indeed due to the inoculation or not cannot be positively asserted, but there is a favorable suspicion that it was.

I wish to publicly experss my thank Mr. Burnham for the extremely kind and liberal support he gave me in my work, placing, as he did, his man and everything I desired at my disposal.

TEST EXPERIMENTS.

The next thing was to try the vaccine test over again. To this end fresh pigs numbered with tags in the ears were selected; their numbers were 41, 42, 43, 44, 45, 46, 47. Nos. 42, 43, 44, 45, 46, 47 were first inoculated with four fluid grammes—in the inside of the hind leg—of a mild vaccine upon November 4, 1886, and again with six fluid grammes of a stronger vaccine upon November 27. While thrown off their feed, and somewhat lame, with some heat and swelling in the inside of the hind leg, they did not seem to suffer very much. No. 41, which was the same pig as number 20 in the previous list that had been fed with pure potato cultivations, was inoculated with the same amount of vaccine as the others (six fluid grammes), on the 27th of November.

December 27 Nos. 41 and 44 were inoculated with six fluid grammes of a fresh culture (second generation) made from the spleen of a hog from a very virulent outbreak at Valparaiso, Neb. These hogs were inoculated directly into the abdominal cavity. On the same day and at the same time Nos. 47 and 46 were inoculated with the same material in the inside of the hind leg.

December 29 No. 41 died from the effects of the bacteria only, that is of septicæmia, or blood poison, as can be seen from autopsy No. 1. Its blood and the tissues of the spleen were literally swarming with the well-known bacteria. Though frozen solid, cultivations grew from the spleen and two rats inoculated with 1 c. c. m. of a boullion cultivation from the same succumbed in forty-eight hours. Pure cultivations were obtained from the rat, and have since been retested and again proved fatal.

Nos. 44, 42 and 46, that had been vaccinated twice in thirty days, were somewhat off their feed and lame a few days, but entirely recovered, while 41, that was only inoculated once, succumbed.

On December 12 numbers 45 and 47 were again inoculated with six fluid grammes of a boullion culture that had previously been tested upon rats and proved fatal. These pigs also recovered completely, and may be considered proof against swine plague.

We have therefore positively proved that we can prevent swine plague by inoculation of healthy swine with an artificially prepared virus.

We have now hogs 44, 42 and 46, that will to a dead certainty withstand all exposure to infection, if placed among sick hogs, as they were tested with a vaccine of unusual malignancy for this year's swine plague in the State.

The fact that No. 41 succumbed so quickly to the same virus, though the liveliest pig in the lot, shows that one vaccination is not sufficient.

Nos. 45 and 47 will probably also withstand any natural test, as they have been inoculated three times.

No. 43 has been purposely left without the final test inoculation, but will, I think, stand it also. While there is an immense amount of detail work yet to be done, we have got to fix the exact amount of inoculation necessary, and the time which is necessary to elapse for the constitutionalization of the virus so that immunity can be produced. I hope to find some small animal so susceptible to the virus, that by passing it through a short series of such animals, it will attain a constancy of virulence

capable of killing hogs in about five days, and have no doubt that it can be done as soon as we have means to experiment properly. This fact settled, we shall then have a simple and more practical way of obtaining material than by taking material from sick swine, where I find there is a great variation in the natural virulence of the germs.

On account of having no place suitable to breed and keep small animals this winter, I have been really unnecessarily retarded in my work, as I think, had its value been truly appreciated, such room could have been supplied me. As it is, I can but think that the work done should satisfy every reasonable person of its quality, and my known skepticism should be a sure guarantee of the trustworthiness of the results. I am prepared to subject the above pigs to any test that may be suggested before a committee of farmers or members of the Legislature, had we means to do it. All we now need is the means to make one grand test experiment, which I propose to do as soon as the funds you have so kindly asked for are at our disposal.

I shall then request a committee of the Board of Agriculture to watch the experiment, and shall inoculate one hundred pigs in different ways and with different amounts, and then place an equal number of diseased hogs among them, and some fifty healthy ones, and am confident that I shall be able to previously name the hogs that will withstand infection on such exposure.

When these results are compared with those made with vaccine inoculations to prevent anthrax, they seem to show that the time in which an artificial immunity can be produced in susceptible animal organisms is dependent upon the virulence of the disease in question; that is, that the time in which artificial immunity can be produced in any given disease will be found to depend upon the rapidity of the course of said disease under natural conditions. Take anthrax, for instance, a disease, the course of which can better be counted by hours than days. According to the reports which have come to us of the results with Pasteur's vaccine, and the methods used to inoculate show that even in that disease it takes from fifteen to twenty days to produce a reliable artificial immunity, but even then, in this case, there seems to be

a want of exact experimental data fixing this period. The animals are first inoculated with a weak vaccine, and ten days afterwards with a stronger one, when they are considered to be free from any danger to natural infection. But the all important question, when this period absolutely begins, has not been satisfactorily determined.

With regard to the swine plague, my idea is, that as this disease is not so acutely fatal, that this period will be found to be longer, say thirty days, and that it cannot be reduced without using a virus so strong as to be dangerous.

Another difficulty which we had to deal with this year was the uncertainty of the natural virus in its virulence. As is well known, the disease has been unusually mild in Nebraska during the summer and fall of 1886, and even in different localities it has varied much in its virulence. In some cases it took very much greater quantities of the same kind of a culture to produce death than others. Another fact of great practical importance in the endeavor to obtain a reliable vaccine is the rapidity with which the germ of swine plague loses in virulence under artificially cultivated conditions, as well as the irregularity in this direction, between the germs of different cultures in different tubes, which were, however, all inoculated from the same original material and at the same time.

These difficulties do not exist with anthrax to any such degree, though the cultivations do lose in virulence after the same original culture has been passed through many successive artificial generations, as has been shown by Germany's great pathogenic bacteriologist, Robert Koch.

The really unpleasant and disturbing characteristics of the germ of swine plague surmount the production of a reliable vaccine with difficulties which can be overcome, however. Pasteur claims for his anthrax vaccine, as well as that for rouget and even rabies, that when a cultivation of the germs has been subjected to a certain known line of treatment, and a certain degree of attenuation attained, that this degree of attenuation remains constant; that is, that a vaccine of the same and a constantly reliable degree of attenuation can always be manufactured from inoculat-

ing or sowing fresh infusions of sterilized boullion, and so on indefinitely. This assertion is contradicted by the above-mentioned experimentally confirmed conclusions of Koch with regard to the bacillus of anthrax losing its virulence after being carried in successive generations through some fifty cultivations.

This, like the majority of Pasteur's assertions, needs the confirmation of exact test experiments.

With regard to the germ of swine plague, our own and other experiences go to show that no such constancy of virulence or attenuation can be depended upon through any large number of successive artificial cultivation, but as said before, it will be necessary to discover some one among the smaller animals (or in case of necessity, by the use of young pigs) that has a very excessive degree of susceptibility to the germ of swine plague, and in which it soon acquires the highest degree of virulency by being passed successively through a small number of said animals, in order to obtain material which can be relied upon to manufacture vaccines from. This is not the difficult task it appears to be.

VETERINARY JURISPRUDENCE.

FORENSIC MEDICINE.

By D. P. YONKERMAN, Cleveland, O.

The importance of this subject is so great that I attempt to write upon it with no little hesitation and fear, knowing that I shall be far from able to do it anything like justice. But trusting in your forbearance, and hoping that something I may vaguely touch upon may give light to some of you, or, at least raise inquiry whereby benefit to the profession and ourselves may result, induces me to undertake at least a synopsis of this vast and important subject. I therefore pray your more than ordinary attention to the subject matter herein contained.

It were well for us at the outset to grasp the impotance and responsibility of our task. Your first day in practice, your first call, may bring you face to face with a medico-legal case requiring all our thought and acumen, powers of observation, knowledge of

facts and habits of induction. To illustrate: an intending purchaser brings you a horse for examination. Is he sound or otherwise? a sale, and possibly a lawsuit, depends on your statement. A valuable colt may have been found; was it born dead or alive? The body of a horse is discovered: what was the cause of death? You are called to see a patient; is its illness natural disease or the effects of poison? These are a few examples of many hundred of questions, any one of which your first day's practice may require you to consider—for the practice of forensic medicine devolves on the profession generally, and not on a few in particular. I admit that in some cases experts are consulted, but for the actual facts, conditions, symptoms and the like observed at the moment, the general practitioner must, as a rule, be held responsible. Think of your responsibility. The evidence given and the opinion expressed by you in open court may be reported in several papers and will be conned over and discussed whenever read; depend upon it, if your evidence in any case be one-sided, if your judgment be biased, if your opinion is not founded on knowledge, or is swayed either for or against the accused by popular sentiment, friendship, or by a want of common-sense or science, that one medico-legal case may mar your career, as it may—if you being thought, learning, power, judgment, discrimination, discretion and common sense to bear upon it—make it. In your testimony be jealous for the truth, careless whom you please or displease; do not let your judgment be influenced one iota by the lawyers or interested person; be careless which way the verdict goes so long as your evidence is that of honest conviction, of intelligent judgment, and of accurate observation.

The faculty of observation, next to the power of scientific analysis, which is so essential to the veterinary practitioner, is almost the essential of a good medical jurist, for many of your observations will have to be conducted under difficulties of a most unusual nature; many in attendance will have an interest in raising a moral dust-cloud to blind your eyes or obscure your vision.

Probably the most trying position of the veterinary surgeon is when giving evidence, and for that reason I shall consider briefly that important branch of forensic medicine, as upon it a great deal depends, for by it he brings the facts he has observed or

otherwise accumulated before the court and the public. It is, therefore, essential that he should have clear views as to what constitutes evidence, and, on the other hand, what is inadmissible as evidence. It is often a matter of regret that veterinary surgeons neglect the study of the rules of evidence, and suffer accordingly. The rule generally laid down is, that "no evidence can be given foreign to the question or points at issue," and this suggests a word on the relationship between the evidence given by an expert and the functions of the jury, which latter are not to be usurped by the former—for instance: In a case of suspected poisoning, the surgeon stated that certain symptoms he noted and described were consistent with poisoning with strychnia. In that connection this question was ruled improper: "Do you consider these symptoms were the result of the exhibition of strychnia?" but the following was allowed: What in your opinion was the cause of the symptoms that you say were consistent with poisoning from strychnia?" The first question the jury were there to decide; the second was only the opinion of the medical expert, and did not userp the jury's duty.

As a general rule, hearsay is not evidence. The law believes no man's bare assertion, but there are exceptions to this rule, as pedigrees, prescriptions and customs; the statements of the dead are admitted as the only means of getting at the facts.

Evidence may be sincere without being true, for instance: A man honestly believes an animal to be sound, and so testifies; but future developments proved it unsound unknown to the man.

Evidence is of two kinds; Positive or Direct, and Circumstantial. Thus if an expert says, "I am certain the lungs were diseased, for I saw them;" then that fact is proved as far as a fact is capable of proof. But if he says, "To the best of my belief the lungs were diseased," explaining at the same time that owing to lack of proper examination or other existing circumstances he is not certain, it is circumstantial evidence.

Thus we must, as expert witnesses, always bear in mind that we are called no to usurp the functions of the jury in venturing to decide the case submitted to them and them only, but merely, as far as we can, to assist them in their deliberations.

Scientific or expert witnesses may be called either as common

witnesses or as experts or (what is perhaps more frequently the case) both as witnesses of facts and as experts.

A common witness has to speak as to the matters of fact which have come within his personal knowledge. That the animal he was called to see had sustained severe injuries; that poison was present in the stomach of the animal on which he held a post-mortem examination, are facts to be proved by scientific witnesses; in which, save in the nature of the facts on which he has to give evidence, he in no respect differs from an ordinary witness. Further, if any fact relating to the case be within the personal knowledge of the scientific witness, a subpœna served on him to speak to that fact in a court of law is as imperative as when served on any other witness. But the skilled or expert witness, as he is termed, is called to state his opinions either on facts observed by himself or proved in evidence by others. No witness can be compelled to give his opinion in the witness box. The expert, however wide his experience, cannot be forced to give the court the value of his general and special knowledge. The skilled witness must form his opinions on the facts he has heard proved. Thus expert testimony has been refused because the surgeon had not been present during the time that the witnesses were giving their evidence, but had based his opinion on the facts submitted to him in writing by the attorney. Hence it is not enough for an expert to run into court the minute he is wanted; but it is necessary that he should be able to say that his opinions are based on the evidence he has himself heard in the witness-box. And here a few words may be suggested on the vexed question of expert evidence. Nothing is meaner to contemplate than a traffic in evidence, either for gain or notoriety. Hence I would suggest the following rule that in my judgment should always guide the scientific expert, namely: that no one is justified in giving evidence in support of a case, or in support of part of a case, upon which he may be especially retained to give evidence, that he does not believe right and true. Any evidence offered by the expert in the witness-box should be honestly and truly his scientific belief, influenced by reasons as definite and as accurate as if he was arguing the points in dispute before a scientific tribunal competent to judge his arguments and pronounce on his opinions. If the ex-

pert be guided by this rule it seems to me that expert evidence will be far from the worthless thing that some would affect to regard it. Always bear in mind that the truth is the object of all legal inquiry. In all expert evidence the witness must never for a moment transgress the limits of scientific accuracy nor with the warmth of a partisan, or the desire to do the best he can for his case, permits himself to color or distort, directly or indirectly, the hard, straight and inflexible lines of well attested scientific facts such as he would never dream of disputing, coloring or distorting before a learned society.

A witness must not quote authorities in the witness-box, although there is sometimes a great temptation to do so. But he must remember that he is called to give *his* opinion and not to say who agrees or disagrees with him. No written or published opinion of a living authority can be quoted even by counsel, the law requiring that if the opinion of such authority be deemed necessary in the judgment of those conducting the case, the authority himself should be called to state his opinion on oath and be subject to cross-examination.

And here I want to give you a word of practical advice. If a quotation from the works of a deceased authority is read to you in cross-examination, and you are asked how far you agree or disagree with the opinion expressed, never under any circumstances accept the quotation as expressing the opinion of the authority in question; neither assent to nor dissent from the quotation until you have asked to be permitted to see the book from which the quotation is made, for a counsel may misrepresent the author wilfully or by mistake, as one sentence preceding or following the quotation read will often put an entirely new aspect on the quotation itself.

(*To be continued.*)

REPORTS OF CASES.

HUMAN AND ANIMAL RABIES.

By A. W. Hoover.

I have just read in the February Review a continued description of rabid animals, and the post-mortem revelations by Dr.

Billings, of Nebraska. Now, Mr. Editor, with your permission, and a small space in the REVIEW, I will state some of my observations of hydrophobia in the human subject, as well as that of the brute creation. I will at present only mention the case of one rabid dog and the disastrous results to life that occurred in Burlingame County, Kansas, twenty-eight years ago. I am prompted to make a statement of this case from a desire to have it recorded for future generations to read, rather than to enlighten any one who may be well informed.

One evening between sundown and dark, as I was going home, I saw Mrs. Parks about a block ahead coming towards me, and a large black dog close behind her on a brisk trot. I immediately put the lady on her guard. As she looked round, the brute was at her right side, and taking her face in his mouth, he pulled her to the ground; then, turning a square angle, he ran off and left her. I took Mrs. Parks to her home and dressed her wounds. They healed by first intention. An effort was made to quiet her mind as to the animal being rabid, but this was of no avail, as she insisted that he was mad. One week from the time of her injuries she was taken to Missouri to try the effects of a madstone, and the result appearing satisfactory, she returned home on the twenty-eighth day after she was bitten. I saw her that evening; she was cheerful, and apparently in good health. Saw her the next morning, and the first words that struck my ears were, "I am mad! I am mad!" In answer to the question as to her reasons for thinking so, she replied, "I have alternate paroxysms of heat and cold through every nerve and fibre of my body." Towards evening a phlegm in her throat became very troublesome, and next day so much so that a pan of ashes was used for her to spit in. When holding the pan for her, she would exclaim, "Don't come too close to me, for I have a great desire to bite!" When a glass of water was presented, she would go into terrible convulsions. Either from fear or having no desire to do so, she ate or drank nothing during her illness, which lasted three days and nights.

After the rabid brute left Mrs. Parks, he ran into the lot and bit one of the horses. From there he went to a barn and bit a two-year-old filly and other smaller stock, and then lay down by

a hay-stack and was killed the next morning. All of the bitten stock either died of rabies, or were killed.

I will only refer to the horse. Two days after the death of Mrs. Parks the animal became uneasy, restless and easily excited. He would dart furiously at a calf which was walking alongside of the fence in which he was inclosed. He then commenced to bite and tear the muscles from his front legs and other parts of his body, and finally ran and jumped into an out-building and tore it to pieces. He was shot in his frantic madness.

CERVICAL DISLOCATION.

By D. A. Cormack, D.V.S.

The following case seems to me of sufficient importance to warrant me in asking for it a place in your very valuable journal.

On December 23d, 1886, I received a telegram from L. V. Sybrant, living eight miles southwest of Watertown, Dak., stating that a mare had been seriously injured, and asking me to come in all haste. On arriving, I found that a fine animal had been kicked during the night by other horses, and when found in the morning she was lying against the wall of the barn, unable to rise, but previous to my arrival they had lifted her to her feet. I found her standing, supported by men. She was paralyzed in all four limbs, her head was inclined to the left side very much, and her nose on the ground. I lifted her head on my shoulder, and straightened the neck. When in this position the paralysis seemed to disappear, but returned on letting go the head, which fell back to the ground and to the left side. When in this position, the animal always kept turning to the right side. With the head on my shoulder, I distinctly felt the dislocation between the fourth and fifth cervical vertebræ. It would bulge to either side as the head was moved from one side to the other. When the neck was straight nothing could be seen, but on moving to either side the bones would jerk past each other, easily seen, felt and heard. I administered diffusable stimulants, put the animal in slings, and boarded the head and neck in proper position, in the meantime giving stimulants, laxatives and diuretics. Appetite was lost for two days; fæcal matter was passed regularly, but micturation had not taken place for two days. I visited her on

the 26th, and passed the catheter; of course this gave great relief. Her appetite returned; she began in a day or two to eat heartily, and in two weeks I took her out of the slings, took down all fixings from the neck, and set her at liberty. Two days after getting out of the slings she aborted her colt. Now she is doing well, feeding and taking exercise as if nothing had happened to her.

INANITION OF A FOWL FROM AN OBSTRUCTION IN THE PROVENTRICULUS.

By Chas. H. Flynn, D.V.M.

There was recently brought to my infirmary a Plymouth Rock cockerel, which, the owner said, had been declining the previous three weeks.

Examination showed the fowl to be wasted to nearly a skeleton; the abdomen nearly empty, the ingluvies nearly full.

Upon questioning the owner, I found that the wants of the fowl had been well provided for, and as I could find no signs of any particular disease, I told my patron the best I could do was to make a post-mortem examination. To this he consented, and after destroying the fowl, we found the cause of the trouble to be the sacrum of another fowl firmly lodged in the proventriculus, and causing a complete stoppage of the tract except to liquids, thus causing gradual starvation.

COMMENCEMENT EXERCISES.

AMERICAN VETERINARY COLLEGE.

The commencement exercises of this institution took place on the 4th of March at Chickering Hall, before a large number of friends of the graduates, alumni, and of the college, who crowded the house a long time before the orchestra of the Seventh Regiment struck up the opening march.

The platform was occupied by the Board of Trustees and the Faculty, and the exercises were opened by the President, F. D. Weisse, M.D., of the Board of Trustees, who, at the call made by Prof. A. Liautard, delivered the diploma and degree of D.V.S. to the following graduates:

Theodore William Apeldorn, Philadelphia, Pa.
Don Carlos Ayer, Leavenworth, Kans.
Leidy James Bachman, Bethlehem, Pa.
Roscoe Rutherford Bell, Brooklyn, N. Y.
George C. Blaker, Flemington, N. J.
Daniel Sylvester Breslin, Brooklyn, N. Y.
George Bridges, Norwalk, Conn.
Solomon Bock, Cheyenne, Wyo. Terr.
Ephraim Booth, New York city, N. Y.
Richard Edward Buckley, New York city, N. Y.
Henry Cady, Cobleskill, N. Y.
Andrews George Collins, New York city, N. Y.
Willis Ward Curry, Mahopac Falls, N. Y.
John Demarest Deronde, Spring Valley, N. J.
Henry Holland Dews, New Bedford, Mass.
John Daniel Fair, Berlin, Ohio.
William Henry Fairbanks, Winthrop, Maine.
Joseph Robert Hammond, Port Jefferson, Long Island, N.Y.
Wilfred Follansbee Harrison, Verona, N. J.
John D. Hartman, Penn, Pa.
William Henry Hitchings, East Somerville, Mass.
Julius Huelsen, Jr., Jersey City, N. J.
Andrew Hyde, Glartonburg, Conn.
Joseph Cornelius Jackson, Yonkers, N. Y.
James Leander Kidd, Midway, Ky.
Patrick Francis Kiernan, Jefferson Barracks, Mo.
Frederick Lamberton, Westfield, Mass.
John Francis McGrath, Pawtucket, R. I.
William Tucker Miller, Plumville, Pa.
John Schorle Meyer, Naopoint, Mo.
Oliver Ritter Meyer, Rittersville, Pa.
Herbert Neher, Rhinebeck, N. Y.
William Hill Nice, Germantown, Philadelphia, Pa.
William Somerville Ortgies, New York city, N. Y.
Albert Tobias Sellers, Philadelphia, Pa.
John Shea, New York city, N. Y.
John Johnson Shoemaker, Bluffton, Ind.
Wilder Daniel Southwick, Millsville, N. Y.

Oliver Henry Tims, New York city, N. Y.
William James Tomlinson, Williamsport, Pa.
Richard Lockwood Tucker, Bermuda, W. I.
Thomas Joseph Turner, Glasgow, Mo.
Lewis Coburn Wakefield, Montville, Va.
George Washington Werner, Joliet, Ill.

The prizes were delivered by Prof. Doremus, as follows: Dr. Julius Huelsen, Jr., the gold medal of the Board of Trustees for the best general examination; Dr. Roscoe R. Bell, the set of books offered by the Alumni Association for the second best general examination; Dr. James L. Kidd, the gold medal given by the Faculty for the best practical examination; Dr. J. D. Fair, the Michener prize of a silver medal for the best paper presented and defended before the College Class Association.

The valedictory address was delivered by Dr. W. Harrison, the address to the class by Mr. F. Coudert, and the prayer and benediction by Rev. Dr. Duryea.

LIST OF VETERINARY PRACTITIONERS

REGISTERED IN WESTCHESTER COUNTY.

Name.	*College.*
Suaman Bradley	American Veterinary College.
Henry B. Boyd	" " "
Frederick P. Ruhl	" " "

REGISTERED ON AFFIDAVITS.

Name.	*How long practising.*
W. S. Hallack	3 years.
A. Y. Mullineaux	20 "
S. G. Tattersall	10 "
Ph. A. Carpenter	50 " ?
A. B. Marsh	7 "
Cable W. Horton	30 "
Mannsell T. Miller	15 "
Ellerd Miller	3 "
Richard Nolan	20 "
John C. Alaire	30 "
David G. Montross	15 "
Ard. T. Reynolds	20 "
Aaron K. Silkman	15 "
W. P. Van Tassell	20 "
Chas. W. Sterns	15 "

IN WAYNE COUNTY.

Name.	*How long practising.*
Charles H. Biglow	20 years.
Cornelius Brundrig	35 "
Erastus Brownwell	35 "
J. Burghdors	20 "
James Clark	6 "
James Curry	15 "
Daniel Crowley	10 "
George Carver	3 "
Marion Cotton	4 "
Henry Chatterson	5 "
Lewis French	16 "
George Hancock	20 "
Charles E. King	20 "
Perry B. Lee	40 "
Meiah Milliman	20 "

Andrew S. Peer.
Charles E. Purdy.
George A. Scullin.
L. D. Seymour.
Obadiah Welch.
John Rushmore.
Lorwin Scullin.
Nathaniel K. Sheffield.
James Vandenburg.
Alfred Wooley.
Henry G. White.

SOCIETY MEETINGS.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The regular semi-annual meeting of the United States Veterinary Medical Association was held at the University of Pennsylvania, Veterinary Department, Philadelphia, March 15th, 1887.

The Comitia Minora was called to order at 10.30 A. M. by the President, Prof. Liautard, and upon roll-call all members except Drs. Lyman and Field were found to be present.

Of the fifteen applications for membership all but one were favorably reported to the general meeting.

Remarks were made by Dr. L. McLean and others concerning the admission of non-graduates. The Secretary gave notice that he would, at the next meeting, propose an alteration of Secs. 1 and 4 of the By-Laws, admitting none but graduates of the veterinary or medical professions to active membership.

No further business offering, the Comitia Minora adjourned.

The regular session convened at noon, with the President, Prof. Liautard, in the chair. Fifty members answered the roll-call.

On motion of Prof. L. McLean, the reading of the minutes of last meeting was dispensed with. The minutes of the meeting of Comitia Minora were read and accepted. The Committee on Education and Intelligence then reported, through its chairman, Prof. Huidekoper. He read communications from the following members of that committee: Drs. Paquin, Coates and McInnes. The report was accepted and placed on file.

At this point, at the suggestion of different members, the Secretary was instructed to enforce Sec. 3, Art. 8, of By-Laws.

Dr. Hoskins, as chairman of the special committee to secure a uniform standard of examinations by the different veterinary colleges of North America, gave a most encouraging report, stating that representatives from the different schools would soon meet, and in all probability adopt such a course.

Dr. Zuill, Chairman of the Committee on Diseases, read reports from different States. This was also accepted and placed on file.

The following gentlemen were then admitted as members of the Association:

Francis Bridge, W. H. Martenet, James A. Walrath, Robert C. Jones, C. Saunders Breed, D. D. Lee, K. Winslow, E. C. Beckett, Thos. Bland, Geo. G. Van Mater, W. E. Cuff, Wm. Rose, T. S. Butler, Wm. Harris.

Dr. D. E. Salmon was then unanimously elected an honorary member.

After the applications for membership were received, Prof. Huidekoper moved an adjournment for lunch, which was carried. (Prof. Huidekoper had furnished an excellent lunch in the college building).

After lunch, Dr. Pendry spoke of the failure of the Committee on Army Legislation to report, and, after reading the pending bill, secured the endorsement of the same by the Association, the Chief Veterinarian to hold the rank of Colonel.

On motion, the President was directed to appoint a special committee to take charge of this bill, and that one hundred dollars be set aside to be used by said committee.

On motion of Dr. Hoskins, the President was directed to appoint a Publication Committee, to publish the reports presented to the meetings of the Association on contagious diseases, etc., and that these reports be distributed among the members of the profession.

In answer to Dr. Salmon, most of the members expressed their belief in the mediate contagiousness of contagious pleuro-pneumonia, and all condemned inoculation so long as the *possibility* of extermination of this disease exists by means of slaughter of diseased and exposed animals.

The following preamble and resolution was unanimously adopted:

WHEREAS, Legislation in Congress on the subject of contagious pleuro-pneumonia has brought before the public the views of certain members of that body in relation to that disease and our profession, which are not in accordance with generally received opinions, therefore be it

Resolved, That this Association does not consider it necessary to determine by any commission the specific character of that disease and its contagious nature, and that we heartily endorse the labors of the Bureau of Animal Industry, and have full confidence in the fulfillment of its future work.

Resolutions were adopted condemning inoculation and endorsing the opinion that contagious pleuro-pneumonia may be extended by mediate contagion.

Resolved, That this Association is convinced that inoculation for contagious pleuro-pneumonia is inapplicable, and should not be adopted in the United States.

Resolved, That no animals should be placed in the infected stables until thorough disinfection has taken place.

Resolved, That all animals exposed to, or having the disease, should be destroyed.

Tuberculosis was next discussed by many of those present, and the following preamble and resolutions were adopted as the sense of this Association:

WHEREAS, Tuberculosis is extensively prevalent throughout this country in both cattle and man, and whereas the consumption of meat and milk from tuberculous animals is the direct cause of a large proportion of the 125,000 human deaths which occur annually in the United States from tuberculosis, therefore be it

Resolved, That the attention of all Boards of Health throughout the country be called to the necessity of a rigid and competent inspection of all milk dairies and slaughter-houses.

Resolved, That all Boards of Health should have attached to their staff *qualified veterinarians* to carry on such inspection.

To further this object the Chair appointed a committee, consisting of Drs. Huidekoper, Winchester and Salmon, to publish the action of this Association in circular form and send it to the different Boards of Health of each State and Territory.

Dr. Pendry gave notice of proposed alterations of By-Laws at annual meeting concerning "Code of Ethics."

The Secretary then read two communications from B. McInnes, Jr., one on the subject of Osteo-Sarcoma, and another, accompanied by specimen, of fracture of skull of horse by the kick of a mule. Owing to the late hour these papers did not elicit the discussion they should have done.

Prof. McEachran, who had taken an active part in all matters of interest before the Association, then urged that as soon as possible representatives from the different veterinary colleges meet and endeavor to raise the standard of studies, and lengthen the course to three years.

Pursuant to this introduction by Prof. McEachran, it was moved by Prof. Lyford, and unanimously carried, that the sense of this Association is, that there be a uniform matriculation examination, three terms, of six months each (and, if possible, a summer session), and that the students of all colleges be finally examined for graduation by a common examining board.

Communications, bills, etc., were then brought to the notice of the Association and disposed of. The banquet was held at the Hotel Bellevue, and was attended by most of the members as well as by several guests prominent in the medical and other professions. There was but one expression of opinion, *i. e.*, that the present meeting was one of the best—if not the very best—ever held by the Association.

CH. B. MICHENER, *Secretary.*

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

(Reported for the REVIEW by W. Horace Hoskins.)

The Pennsylvania State Veterinary Medical Association met at Philadelphia on Monday, March 14th, 1887. Prof. Sallada called the meeting to order at 10.30 A.M. On roll-call, the following members responded:

Drs. W. S. Wooster, T. B. Raynor, Geo. B. Rayner, J. R. Keeler, J. W. Sallade, R. Gladfelter, S. E. Weber, W. H. Knight, H. T. George, P. M. Minster, J. C. Fly, Z. S. Keil, W. Horace Hoskins, R. S. Huidekoper, James B. Raynor, John B. Raynor, Alex. Glass, N. Rectenwald, Isaiah Michener, J. Curtis Michener, W. L. Zuill, John R. Start, Francis Bridge, C. J. Blank, N. E. Reinhart, J. U. B. Tretz.

The following were present as visitors: Dr. C. J. Moulton, of Washington, D. C.; Dr. A. T. Sellers, Dr. W. B. E. Miller, Pres. of New Jersey State Association.

The minutes of the last meeting and special meeting were read, and with slight corrections adopted.

Nominations and election of officers being in order, the following were chosen for the ensuing year:

President—Thos. B. Raynor, V.S.
1st Vice-President—W. L. Zuill, M.D, D.V.S.
2d Vice-President—W. H. Knight, V.S.
3d Vice-President—P. M. Minster, V.S.
Corresponding Secretary—Alex. Glass, V.S., 2006 Bainbridge Street, Philadelphia.
Recording Secretary—R. Gladfelter, V.S.
Treasurer—J. C. Fly, V.S.
Board of Trustees—J. C. Michener, W. Horace Hoskins, James B. Raynor, W. S. Hooker, and R. S. Huidekoper.

A recess being taken, the Board of Trustees convened and recommended for membership Dr. C. C. McLean, of Meadville, Pa., a graduate of the Toronto College.

The Committee on Legislation, through Dr. W. Horace Hoskins, reported a new bill that had been drawn up, embodying new features. The bill was then read and explained, and adopted.

After some discussion as to the plan to pursue in regard to members who had as yet failed to comply wlth the requirements of the Association, it was decided by a unanimous vote to destroy the certificates of Drs. Jas. McCoart, A. S. Sheimer, C E. Ogden, L. C. Campbell, and A. S. Borneman.

The meeting then adjourned, to partake of a bountiful lunch provided for the members and visitors by courtesy of the Philadelphia members of the Association.

On reconvening the President announced as a committee on legislation, to take up the work of arousing the profession and its friends to the importance of this step, this committee to work in harmony with a like one from the Keystone Veterinary Medical Association: Drs. W. Horace Hopkins, W. S. Hooker, W. L. Zuill, R. S. Huidekoper, C. C. McLean, N. Reckwold, and Jas. B. Raynor.

The death of Dr. M. W. Birch then being referred to, the President appointed Drs. T. B. Raynor, W. S. Hooker and W. Horace Hoskins a committee to draft appropriate resolutions.

After kindly referring to the able letter of Prof. Law to the authorities at Washington, relative to contagious pleuro-pneumonia, it was unanimously decided to extend him a vote of thanks from this Association. A similar act was extended to the Bureau of Animal Industry for their most excellent work.

Dr. C. C. McLean, of Meadville, then outlined a bill that had been presented at Harrisburg, establishing a license for horses used for stud purposes, requiring that they be examined for soundness by a qualified veterinary surgeon before registration, and giving their owners power to recover by law, after 9 months, the fees for service. At this point Dr. Huidekoper referred to the number of prize stallions, cattle, etc., in the State who were unsound and blemished and utterly unfit for breeding purposes. Dr. Hoskins heartily agreed with the good features of the bill, but looked only for it to be a dead letter in great measure, as there was no law, moral or statutory, that yet defined for Pennsylvania a qualified practitioner of veterinary medicine and surgery. The sense of the bill was approved by the Association.

The National Veterinary Medical Association having sought from our Secretary the reason why our Association had not paid the assessment levied upon it, the Secretary, on motion, was directed to inform them that this Association acknowledged no allegiance or sympathy with that body, and did not propose to pay any such assessment.

The reading of papers being next in order, Dr. W. Horace Hoskins opened the subject now generally referred to under the name of "Azoturia." He offered for discussion the probability of it being a nerve lesion, of the vascular character, having its seat about the centre of lumbar enlargement of the spinal cord, involving particularly the anterior or inferior cornea of the cord, giving a number of peculiar symptoms and conditions noticeable in the course of these cases, that could only find a reasonable interpretation under the above heading. A good discussion followed, being entered into by Dr. J. C. Michener, who was impressed that it was largely a muscular disease, with great congestion of the blood vessels. Dr. Huidekoper agreeing in many points with the essayist, was rather disposed to class it under a similar heading with summer vertigo, with its starting point at the liver. Further remarks were indulged in by Drs. Zuill, Rectenwald and Start.

An able article was then read by Dr. Alex. Glass on "Sanoline," giving its origin, value and uses in veterinary practice.

Dr. Huidekoper exhibited specimens of glanders and farcy taken from subjects in his anatomical rooms, and gave a demonstration of the characteristic lesions noted.

The next meeting was announced to be held at Pittsburg, Pa.

The seating of the new officers then followed, with appropriate remarks, after which the meeting adjourned.

MARYLAND STATE VETERINARY MEDICAL ASSOCIATION.

A regular meeting of the Maryland State Veterinary Medical Association was held at the Academy Hotel, Franklin and Howard streets, Baltimore, on Thursday evening, February 17, 1887, at 8 P. M., a large number of members being present.

Letters of acceptance of honorary membership were read from A. Liautard, M.D., V.S., New York; E. M. Hunt, M.D., and W. B. E. Miller, D.V.S., of New Jersey, and R. S. Huidekoper, V.S., of Philadelphia, and on motion were filed with the Secretary. Dr. Martenet read the amendment to the constitution and by-laws offered by him at the preceding meeting, and to be known as Chapter I., Article IV., reading as follows:

The officers of this Association shall be elected at the regular meeting in February of each year for the term of one year.

The amendment was adopted. The Treasurer's report for 1886 was then read, and on motion was accepted.

T. F. Barron, V.S., of Baltimore, was nominated by Dr. W. H. Rose and elected to active membership, as was also A. F. McMaster, V.S. (Ontario College), Frederick, Md. Drs. C. P. Lyman, Massachusetts, F. S. Billings and J. F. Winchester, Massachusetts, were elected to honorary membership.

Officers were elected for the ensuing year as follows: President, William Dougherty, D.V.S.; 1st Vice-President, C. L. Moulton, D.V.S.; 2d Vice-Presi-

dent, T. W. Spranklin, D.V.S.; Secretary and Treasurer, W. H. Martenet, D.V.S.; Board of Censors, Drs. William Dougherty, W. H. Rose, G. M. Steck, T. W. Spranklin and T. F. Barron.

Dr. Dougherty then exhibited specimens of fistulous tracts, obtained by the use of perchloride of iron tincture, and dilated upon the useful qualities of this drug for fistuluous tracts of all kinds. A motion of thanks was extended to the retiring officers, and the Association then adjourned.

W. H. Martenet, D.V.S., *Secretary.*

ALUMNI ASSOCIATION OF THE AMERICAN VETERINARY COLLEGE.

The regular meeting of the Alumni Association of the American Veterinary College was held in the lecture room of the College on Thursday, March 3d, President Dr. Hoskins in the chair.

On motion, minutes of last meeting were laid over, and a motion being carried to admit the class of '87 to membership, a committee was appointed by the chair to so inform them, who returning with many of the graduating class, were welcomed and congratulated by the President.

The Committee on Dinner reported what arrangements had been made, which was received.

The report of the Committee on Prize was received through Dr. Pendry. On motion, the report was received, and an order was drawn on the Treasurer for the cost of the prize, together with the Secretary's account for disbursements.

Under unfinished business, the question of changing the date of meeting was again brought up, when, on motion, the matter was referred to the Executive Committee, with power.

The Secretary said he had been notified by the Dean of the Faculty that the Association was to elect an Alumni Trustee, as Dr. Hall's term had expired. He was instructed to reply, stating that Dr. W. B. E. Miller, Camden, N. J., had been elected to succeed Dr. Hall at the last meeting.

The election of officers was then proceeded with, and resulted as follows:

President, Dr. D. J. Dixon; Vice-President, Dr. H. B. Boyd; Secretary, Dr. W. H. Pendry; Treasurer, Dr. S. S. Field; Librarian, Dr. W. H. Hoskins.

The meeting adjourned to Clark's Hotel, where those present sat down to a well-laid table. The gathering was not as large as might reasonably have been expected, but it was a very pleasant one, and the faculty was well represented.

W. H. Pendry, D.V.S., *Secretary.*

CORRESPONDENCE.

VETERINARY LEGISLATION.

Editor American Veterinary Review:

Dear Sir.—I trust you will allow me to remind Dr. Lowe, in answer to his letter in your last issue, that the bill passed by

the New York Legislature was mutilated after it left my hands, and consequently its value lessened; but who is to be held accountable for such mutilation, I leave it for others to say; but it was done without my knowledge. However, it is one thing to ask, but quite another thing to get just what you may want, and certainly no easy matter to get a State law from a legislative body representing over five millions of people.

Looking over the proposed New Jersey bill, as published by you, I fail to see any of the good qualities of a bill that Dr. Lowe is so full of; perhaps he is one of those godly people who are taught to expect little. It simply calls for two years' experience to entitle any one to register, and even provides that "diplomas" issued by a county shall be recognized. Every bill following the New York one should be an improvement, certainly not the reverse.

In conclusion, I would say that I, notwithstanding all the endorsements presented, consider the proposed New Jersey bill is not by any means as good a one as that already in force in New York State.

W. H. Pendry, D.V.S.

REGISTRATION OF SELF-CONSTITUTED VETERINARIANS.

Fishkill-on-Hudson, N. Y., Feb. 12, 1887.

Editor Veterinary Review :

Permit me, through the columns of the Review, to state that veterinary legislation has done little for the profession, at least in this section, as the registration of laymen still continues after the expiration of the time fixed by law expired, *i. e.*, November 11th, 1886. When in the County Clerk's office at Po'keepsie, the other day, I took a peep at the Veterinary Medical Register, and there found the names of the following gents who had sworn in on the following dates:

Benjamin C. Risedorf, Rhinebeck, Nov. 22d, 1886.

Godfrey Wolvern, Manchester, Nov. 23d, 1886.

Albert Flagler, Po'keepsie, Nov. 29th, 1886.

I asked Mr. Osborne, County Clerk, if any Supreme Court Judge gave a mandamus ordering their registration, when he answered in the negative, but said the last named had been highly recommended by the Supervisor. Now, the question arises,

what's going to be done about it? I would like to hear your views on this subject, through the next issue. There are other parties in this section who have registered without any claims whatever under the law. I shall give you the name of one, T. D. Roberts, who swears he has been practicing veterinary medicine and surgery as a profession for the last twelve years. Now, the fact is, this would-be veterinarian is a domestic—a knight of the stable-fork and broom, wearing livery and a cockade in his hat, and in the employ of the late A. W. Sargent and his relict, then and now a Massachusetts family spending every winter in Boston and the summers at Fishkill-on-Hudson. This worthy I have made strong efforts to bring before a Dutchess County grand jury for indictment, and for that purpose appeared before the District Attorney, John Hackett, in consort with N. F. Thompson, D.V.S., but met with stern opposition from a practitioner of that city, who, by the way, had been swearing for years by an authority of one of the veterinary societies which now appears only to bear date Sept. 15th, 1886. If the members of the various veterinary societies remain as lethargic and tardy as they have been of late years, I propose to give a number of them a general fanning through the medium of the leading newspapers of this State—the only medium, I believe, that will arouse them to proper action, which I will abstain from if the profession make a move in the right direction; but with the experience I have had in various veterinary societies and associations, I cannot but echo the sentiments of C. H. Peabody's appeal in your last issue.

Yours truly,

W. D. Middleton, V.S.

ANIMAL INSURANCE.

Editor of American Veterinary Review:

It would evidently look as if the services of veterinarians are getting down to a pretty low ebb, when an insurance company can manage to throw them in, as a tea store does crockery. The value of the service, of course, is not guaranteed, and well it might not be, if the examination for "unsound" and "diseased" horses are to be a guide. A client of mine lately had four horses insured at a cost that is promised not to exceed thirty-five dollars

for the year, in the Live Stock Owners' Mutual Benefit Association. This covers the loss of one or all the horses during that time, and veterinary services for the same period, and the examination of which constituted a punch in the ribs, to which the patient gave the usual response, and so was pronounced a fit subject for insurance. It would seem to me that this concern is offering a little more than it can do, at least the party in question thought so, as they said they would wish to keep their own veterinary services, so I write this with no hard feeling in the matter.

There is another insurance affair, called the Horse Owners' Mutual Benefit and Indemnity Society, but which has some regard for veterinarians, it having a consulting veterinary surgeon.

I have been written to from out of town regarding this insurance question, and I need hardly say that I have not endorsed the first-named, nor could I do so conscientiously, but I have not hesitated in saying that the Horse Owners' Mutual Benefit and Indemnity Society were not apparently offering to do more than they could carry out. In short, the one should be endorsed by the veterinary profession, and the other should not—a view I hope most of your readers will approve.

Yours truly,

W. H. Pendry, D.V.S.

A CORRECTION.

Paterson, N. J., March 7th, 1887.

Editor American Veterinary Review :

The act to regulate the practice of veterinary medicine and surgery in the State of New Jersey, as printed in the March number of the Review, contains an error which I desire to rectify. In the second section, "two years' experience," etc., should read, "ten years' experience."

Wm. Herbert Lowe, D.V.S.

AMERICAN VETERINARY REVIEW,

MAY, 1887.

EDITORIAL.

ETIOLOGY OF HOG CHOLERA.—Dr. F. S. Billings makes his report to the Regents of the University of Nebraska—his review of work done previously—his acknowledgment of the researches of Dr. Detmers—investigations of Dr. Klein, Prof. Law and Dr. Salmon—the germ of hog cholera is not a micrococcus, nor is it a bacillus—it is a bacterium—its characters—the *micro-organism* is *entirely mobile* —other characters—conclusions of the report. REGULATION OF VETERINARY PRACTICE.—The law in New York State—*benefits* derived by the *pretended* legislation—New York veterinarians ought to have something better—no law would be better than the one now in existence—by it any one can register—if he cannot, he does not need to mind it, as there are many other ways to obtain registration—how long will this last—requirements to obtain a good law—these are precious jewels. SANITARY REPORTS—they are to be found in the State Veterinarians' Reports—they generally complain of the prevalence of several contagious diseases —why are they not published here as in Europe ?—our call for the same ignored, or at least, neglected by American veterinarians. HORSE BREEDING RECOLLECTIONS. —an excellent little book by Count Lehndorff. NOTICE—*Retardataires* to the REVIEW—a last call to them—card sent to inquire as to renewal of subscription.

ETIOLOGY OF HOG CHOLERA.—In January last, Dr. Billings submitted to the regents of the University of Nebraska his report in relation to the labor performed in the laboratory of the State University in the experimental study of contagious and infectious diseases, and principally as involving the Etiological Moment in Swine Plague. And on account of the importance of the subjects, when such various opinions prevail touching the true nature of the disease in question, and considering the existing rivalry amongst biological investigators of hog cholera, we are sure we do not err in renewing the topic and appropriating a liberal share of our space to the discussion, even though it involves

the repetition of portions of the long and thoroughly scientific paper referred to. We hope to confine our quotations, however, to points of special interest to our readers and ourselves, and, particularly, as the author has addressed to ourselves a reply to a letter, heretofore published, from a prominent and able investigator and laborer in the same scientific field—Dr. Salmon.

As the length of Dr. Billings' paper renders its publication in its entirety in a single number of the REVIEW impracticable, and necessitates its appearance in separate parts, a recapitulation of its contents in advance will not be out of place.

The first part of the report is devoted to a statement of the results accomplished and reported previous to his own administration of the office, and includes those of Dr. Klein in 1876, and of Drs. Law, Detmers and Salmon subsequently. His review of the labors of Dr. Detmers is especially complimentary, and his favorable impressions are conveyed in his usual emphatic way of expressing his views. Here is what he says:

"I shall show that every right of priority for the original discovery of the only and true germ of American swine plague belongs to Dr. Detmers, and should the disease-producing germ prove eventually to be identical (as I am now inclined to believe against my former opinions) with the germ discovered by Loeffler and Schutz in connection with the German swine plague, although these claims do not interfere with my own as an independent and secondary discoverer of the same micro-organism. My work in this regard not only confirms that of Dr. Detmers in every essential, but I hope goes to correct some of his misconceptions, and will, I know, place this question of the etiology of American swine plague upon an impregnable scientific foundation. I also desire to testify to the extreme value of Dr. Detmers' field observations which give much evidence as to the nature of this porcine pest which it would take a long time to collect in the same practical form."

Following this, a large portion of the report is appropriated to an examination of the methods of these investigators in conducting their experiments, and while the various errors attributed to them are described and explained, due credit is awarded to well performed and successful work.

Referring especially to Dr. Detmers, his failure is attributed to want of proper instruments, a lack of coloring or staining ability, and deficiencies in means of investigations rather than to actual error in his interpretations of facts.

Reviewing the writings of Klein, who considered the germ of hog cholera, as Professor Law also did, a micrococcus, and also the conclusions of Detmers, who at one time called it a bacillus (bacillus suis) and again a micrococcus, Dr. Billings, after a few remarks on the morphological and histological phenomena of micro-organisms, proceeds to the observations which he has personally made, and says:

"The micro-organism of the true American swine plague is, then, a bacterium in its mature form. It is not a micrococcus.

"It is oval, being at least twice as long as wide when fully developed; its length as a mature individual being about one-half the diameter of the red blood cell of a hog when examined in freshly drawn blood under the microscope and care is taken that no atmospheric or chemical influences interfere with the morphology of the blood cell.

"It colors best in methylen-blue and methyl-violet; next best in gentian-violet and methylen-green; also very well in other violets, especially in a variety known as Hoff's violet, but not as well as many other organisms in fuchsin. As has been pointed out by Loeffler and others in Germany, the coloring capacity of many of these dyes is increased by adding to saturated solutions of the same in the coloring glass an equal quantity of a solution of caustic potash 1-10,000 aqua."

This bacterium is difficult to discover. The manipulations attending the process of coloring are delicate, but still its histological phenomena may be readily observed. Its method of proliferation is characteristic.

"*First let me say that this micro-organism is most actively mobile in fluid cultivations*, and that every one of the (to be described) biological phenomena can be seen, and are better seen, in a fluid culture than any other way."

The *true bacterial* nature of the disease being thus well established, Dr. B. takes up the subject in the post mortem lesions, and undertakes to solve the question often put, as to whether the American swine disease is analogous to that of Germany, or if hog cholera is similar to the schweineseuche. With a cursory review of the writings of Klein, Roloff, Schutz and Hueppe, the author presents his conclusions as follows:

"1. That the American swine plague is, first and most important of all, an extra organismal infectious septicæmia.

"Characterized:

"(a) By a peculiar swollen hæmorrhagic condition of the lymph-gland.

"(b) By pneumonia of a peculiar character.

"This is all the American swine plague consists of; other lesions accompany it, but are not essential to it.

"2. That the only and genuine American swine plague is caused by, apparently, the same germ as that discovered by Schutz in the German disease, and, if the natural characteristics are the same, that the diseases are identical. * * * * * * * * * * * * * * *

"3. Swine plague proper is a strictly infectious disease, and not a contagious disease in any sense of the term.

"4. That the so-called 'characteristic' ulcerative and neoplastic conditions, so frequently found in the large intestine in swine plague, are not necessary complications in that disease, and, hence, are not pathognomonic to it. * * * *

"5. That death can be induced in healthy swine by inoculating them with an extra quantity of a very virulent virus, without there being an essential lesion present other than those in the lmyph-glands, and more or less ecchymotic hæmorrhage. * * * * *

"6. That those cases of swine plague which are characterized by an intense cholerine discharge are more frequently free from the so-called 'characteristic' ulcerative lesions in the large intestines than complicated by them.

"7. That the cases characterized by the so-called 'characteristic' intestinal lesions are more often accompanied by constipation, until the latest stages, than by diarrhœa.

"8. That the choleroid discharges are, in reality, those generally accompanying the last stages of septicæmia, and, hence, are not dependent upon ulcerative lesions in the intestines.

"9. That the term 'hog cholera' is a misleading misnomer, and that the disease is really a septicæmia, with the lesions in the lymph-glands and lungs as its peculiar characteristic, but also accompanied by the usual acute parenchymatous process in the chief organs in the body—liver, spleen and kidneys. Notwithstanding the fact that Law and some other observers report no lesions in the kidneys, every competent observer will find these organs the seat of acute parenchymatous disturbances in every case of natural infection; the cortex being opaque, anæmic, of a yellowish-gray color.

A few words touching the value of the pulmonary or intestinal lesions, as found by American, English and German writers, and a reference to the possibility of its transmissibility to cattle, completes this valuable addition to the literature on hog cholera.

Regulation of Veterinary Practice.—The passage of an act *pretending* to regulate the practice of veterinary medicine in the State of New York last year, having induced veterinarians in various other sections of the country to undertake the introduction of similar State legislation, we have thought that a few remarks touching the *benefits* (?) enjoyed under its operation by their New York fraternity might be pertinent and profitable.

Such objections to the new law as experience may have suggested since there has been opportunity for observing its working may also possess a certain interest and value, as tending to modify any enthusiastic anticipations which may have found their way into the minds of persons of a sanguine disposition in respect to the same matter, and who may be impatiently waiting the movements of their dilatory representatives in their several halls of legislation in other States.

It is not our intention to indulge in any extended remarks touching the New York law. We at first looked upon the act with favor and anticipated good results from its operation. Since then we think we have seen good reasons for characterizing the measure as the worst misfortune that ever befell the veterinary profession, and that so long as the veterinarians of New York are content to submit themselves to the disgrace now fastened upon them, they can claim no sympathy or commiseration on account of the low standing of the profession of their choice. Their bill was subjected to a shameful mutilation; the act, when passed, was condemned and thrown aside by mandamus from the courts, and a new act destroying the first is about to be passed, under which ignoramuses of all shades are to be authorized to buy certificates of proficiency, with which they will be entitled to register. What more may be necessary to bring the veterinarians of the "Empire State"—the birthplace of veterinary science in America—to a keen realization of the disgrace and shame of the deplorable attitude they are at length compelled to maintain? But a judge's mandamus or a retail certificate, bought in the market, are not at all necessary for an aspirant to veterinary profit and honor. Every man that has ever handled a four-legged animal is allowed to register. It may be the man who has castrated a few colts, or it may be the man mentioned in the letter which we publish from one of our correspondents, who asks for virus for the inoculation of cows against tuberculosis—*they all get recognition.*

This is the practical result of the law passed in New York, and from the provisions of which we hope our colleagues in other States will successfully labor to escape. No law at all is

better than bad legislation. Matters *may* go right under anarchy—they *must* go wrong under a bad law. Veterinarians ought now to be strong enough to obtain a proper recognition and regulation of their profession. If they are not, it would be better without any. But if they must have a law, let them not venture to press their demand for it until they are *unanimously earnest in their action; unanimously* HONEST *and* WORTHY *of the distinction they seek; devoted to their profession and jealous of the honor it confers and merits.*

SANITARY REPORTS.—The reports of the official veterinarians, acting in various capacities, in several of the States, have reached us, and they embody much information of value and interest on the subject of the contagious diseases of the domestic animals of the United States. The fear of the extension of contagious pleuro-pneumonia and the preventive measures recommended against it, occupy an important place in the reports of Drs. Holcombe and Hopkins, while the extensive existence of tuberculosis, glanders, hog cholera and anthrax, in its various forms, are mentioned in all, giving a general idea of the losses annually sustained from the ravages of disease amongst this living property so largely constituting the wealth of our people. In Europe, sanitary reports are published by authority, and find their way through the veterinary papers to an interested public. Some time ago we suggested the propriety of the adoption of this custom in this country. Our case, however, failed to meet with so favorable a reception as we anticipated, and now, when information may be required on these subjects, it must be hunted for in the Reports of the State Veterinarians on file with the States employing them. It will scarcely be contended that this is the best way.

"HORSE BREEDING RECOLLECTIONS," by Count Lehndorff, is a very handsomely printed book of sixty-four pages, received by us from Messrs. Porter & Coates, of Philadelphia. The work is illustrated by a number of very fine engraved portraits of rare horses. The Count is well known in thorough horse-breeding circles, and his observations are of much value to all, and especially to persons interested in particular breeds. The question of

in-breeding and out-crossing is fully considered, and though the conclusions of the author are adverse to close in-breeding, much valuable information may be obtained on that subject from the pages of this handsome little book.

NOTICE.—It is with regret, but it is upon compulsion that we do it, that we once more call attention to the fact that *many, very many*, of our subscribers have failed to remit their dues. Some are delinquents of one, some of two, a few of three, and some of even four years' standing. Though it was never our expectation to find in the REVIEW a source of wealth to its proprietor, it was never his calculation to suffer its publication to involve him in debt. This may be considered as a last reminder to our non-paying readers of their indebtedness. Their dues must be paid, or their names will disappear from our mail-book. The postal that we have sent lately was to enable us to correct our list of subscribers and do away with the irregular delivery as much as possible.

ORIGINAL ARTICLES.

THE ETIOLOGICAL MOMENT IN AMERICAN SWINE PLAGUE.

REPORT OF THE WORK DONE IN THE LABORATORY OF THE STATE UNIVERSITY OF NEBRASKA FOR THE EXPERIMENTAL STUDY OF CONTAGIOUS AND INFECTIOUS ANIMAL DISEASES.

To the Hon. C. H. Gere, President of the Board of Regents, and Prof. C. E. Bessey, Dean of the Industrial College:

GENTLEMEN—The demands of the public seem to require some information upon the work which my position in the University has called upon me to do since my appointment. In accordance therewith I have decided to offer to your honorable consideration a series of papers detailing said work at such times as its stage of completion warrants. Trusting the accompanying report will justify the honorable responsibilities you have conferred upon me, I remain, your obedient servant,

FRANK S. BILLINGS, Director.

Lincoln, Neb., Jan. 2, 1887.

THE ETIOLOGICAL MOMENT IN AMERICAN SWINE PLAGUE.

The time seems to have come when I should begin to make some personal announcements of the results of my researches upon this porcine malady.

In the following paper I intend to confine myself almost entirely to its etiology.

In an article which I published in Nebraska papers some time since, the following statement was made which requires some correction. I then said:

"While Drs. Law and Detmers have made some investigations into the cause and nature of American swine plague in years past, they have but little practical value, and do not require consideration at this time, and it is especially to those of Dr. D. E. Salmon, Chief of the Bureau of Animal Industry at Washington, that I desire to call attention at present." * * *

In explanation of my assertion with regard to the work of Messrs. Law and Detmers and in justice to myself, I must first say that my attention at that time had only been given to the characteristics of the cause of swine plague, and that in looking up that subject I found that Dr. Law had certainly not described any micro-organism such as I had found and proved to be the cause of swine plague, beyond all manner of question. With regard to Dr. Detmer's claims, I was misled by his remarks in the report of the Department of Agriculture of 1878, in which he names the object seen by him "bacillus suis," and certainly describes a rod-organism, and as I did not then see any change of name in subsequent reports, in any of the headings, and did not carefully look over every word of the text, I assumed that Dr. Detmers was still describing the same object, particularly as I saw no allusion to anything else in Dr. Salmon's reports, which I did study word for word and sentence for sentence. An accident led me to the study of Dr. Salmon's work, which was his attack upon that of the State Veterinarian of Nebraska, which, while I knew it to be incorrect, still I did not care to let go actually unchallenged. I then studied Dr. Salmon's work with the result of at once discovering many inconsistencies in it, and fully as much untrustworthiness as in that of the State Veterinarian of

Nebraska. This has all been shown elsewhere. Since then my own work has arrived at such a degree of completion that the mass of clinical and experimental notes that have accumulated demanded that they be at once arranged in some systematic order, in order to prepare for future work in the spring.

This necessitated my making a most exact study of everything that had been contributed to the etiology of swine plague in this country and in Europe, with the exception of the work of Dr. Salmon.

My surprise can well be imagined when on doing this with regard to the work of Dr. Detmers, I found that he had (in the report of the Department of Agriculture, 1880–'81), described a very different organism to that mentioned in the report of 1878, but had not given it any distinguishing name (which, had it been done, would not have escaped my attention), and that from a mass of somewhat contradictory statements, it was possible to pick out evidence showing conclusively that he had had at times the true etiological organism of American swine plague under observation. * * * * * * *

I shall show that every right of priority for the original discovery of the only and true germ of American swine plague belongs to Dr. Detmers, and should the disease-producing germ prove, eventually, to be identical (as I am now inclined to believe against my former opinions) with the germ discovered by Loeffler and Schutz in connection with the German swine plague, although these claims do not interfere with my own as an independent and secondary discoverer of the same micro-organism. My work in this regard not only confirms that of Dr. Detmers in every essential, but, I hope, goes to correct some of his misconceptions, and will, I know, place this question of the etiology of American swine plague upon an impregnable scientific foundation. I also desire to testify to the extreme value of Dr. Detmers' field observations, which give much evidence as to the nature of this porcine pest which it would take a long time to collect in the same practical form.

Dr. Detmers, and especially Dr. Law, have also given much valuable evidence of the possible prevention of this disease by a

vaccine, and I must express my surprise that, with the unusnal advantages the latter has enjoyed for such experimentation, that Dr. Law has not long since pushed this work to its definite conclusion. I will simply say that we have confirmed these conclusions in Nebraska, as will be shown when I find time to write a paper upon this part of the subject, in which I shall give full credit to the work of Messrs. Law and Detmers. We will now turn our attention to the point in question—*the etiological moment in American swine plague.*

The first investigations upon this important question were made in England by Dr. Klein in 1876, but resulted in nothing of value, as has been shown by Dr. Salmon and alluded to in one of my previous papers. In this regard the following may not prove uninteresting:

My assistant, Dr. Thomas Bowhill, M.R.C.V.S., happened to have in his possession some very delicate sections of tissues—lung and kidneys—of swine plague which he brought from England. I requested him to dismount them very carefully and to remove all the balsam out of them. I was particularly desirous he should do this, as it was especially appropriate that an Englishman (or rather a Scotchman) should be the first to discover the true germ of swine plague in the tissues of English hogs, if possible. Dr. Bowhill (who has become an adept at staining, and does all my work of that nature), successfully demonstrated the presence of the same micro-organism in the tissues of his English hogs that we had invariably found in those we were studying here.

The first American investigations were made by Drs. Law and Detmers and published successfully in the reports of the United States Department of Agriculture beginning with the year 1878 and continuing in 1880-81, when Dr. Salmon enters upon the arena, though he had done some work previously.

Dr. Law's conclusion with regard to the etiological micro-organism of the American swine plague have not been confirmed by later investigations, but are as follows:

"This affection is characterized, perhaps (!) most important of all by the presence of colonies of minute globular micrococci in

the various seats of morbid change," p. 378, report 1878. In support of the hypothetical etiological connection of these "micrococci," which, from the language used, I am led to think Dr. Law looked upon as the cause of swine plague, he quotes Dr. Klein (Eng.) as follows:

"In 1877 he (Klein) cultivated the micrococcus for seven successive generations * * * and finally inoculated the product of the fifth and seventh generations successfully on two pigs, which seems to establish that these microphytes are the ultimate cause of this disease." Ibid, p. 378.

I regret to have to call attention to the direct contradiction of the above statement by Dr. Law himself, only three pages further on in the same report, where he says:

"From the cultivations of the fifth and seventh days, respectively, a drop was taken and two pigs were successfully inoculated."

"In the cultivations of each day were found myriads of bacilli, but no other organization (it should be organism—B.) and thns Klein was the first to show that the bacillus is the probable (!) cause of this disease." Ibid, p. 1881.

In the report of 1880-'81 Law says: "By a parity of reasoning it is probable (!) that the swine plague, which is presumed (!) to be caused, like anthrax, by bacteridean infection, etc."

It will thus be seen that Dr. Law has added nothing to the question, and hence we can leave him.

In order to place Dr. Detmers' position fairly before the public, as well as my own, it will be best to first notice his work in the report of 1880-'81, where he corrects his previous assertions and admits that he was mistaken with regard to the object which he styled "bacillus suis" as follows:

It may be casually remarked that the State veterinarian of Nebraska has lately shown his entire ignorance of this subject in the official report of the State veterinarian and sanitary live stock commission of Nebraska, December 1, 1886, where he says: "It is necessary to mention that swine plague is produced and spread by a germ called the bacillus suis."

Detmers says: "As to a proper generic name for the swine

plague schizophytæ I am at a loss. * * * They are not bacteria—by which he means rods—because the single cells are round." (Of this even he does not feel certain, for he immediately says): "They can hardly be considered micrococci, because in their developed form they are bispherical," p. 185. On page 186 of the same report, Detmers gives a description of this object, as sent by him, which should remove every doubt that the right of priority of discovery belongs to him, and that whatever I may have done to add to this knowledge is due to the extreme educational advantages that I have enjoyed in the latest methods of bacteriological investigations under the best masters in Europe.

Detmers further says: "The swine plague schizophytæ present themselves in different shape and form. The simplest form, it seems, is that of the micrococcus, a small round globule, which strongly refracts the light. *The second form is bispherical*, (This is his great error, as this is the first or mature form of the organism—B) the globular cell, micrococcus, has duplicated itself. The globular or spherical cell, or micrococcus grows and becomes somewhat oval in shape, but keeps on growing, while the indentation becomes deeper, still its length is about twice its width, and its shape bispherical. For some time, however, the bilateral indentation does not effect a complete separation; a connection between the two spherical cells remains sometimes only for a short time, sometimes longer. The bilateral indentation becomes deeper, while at the same time the single cells commence to grow and assume a somewhat oval shape, and in both another bilateral indentation becomes visible. Meanwhile the separation in the middle becomes perfect, and soon one bispherical cell has developed into two bispherical cells, or micrococci, which are yet slightly connected; at any rate they remain together, although the separation appears to be perfect, as each cell presents its own outline." Ibid. p. 187.

My attention was called to a later publication upon this subject by Dr. Detmers, in the *American Naturalist*, vol. 16, by Dr. J. M. Heard, V.S., of New York city, and I am indebted to Prof. C. E. Bessey, Dean of the Industrial College of the University, for the use of the volume in question.

Detmers considered it, in this paper, to be a "micrococcus" and mistook this, the vegetative, for the mature form, and the mature form for vegetative.

Here he says:

"The swine plague schizophytæ present themselves in three, and probably four, and even five different forms. As to three different forms I am certain, but as to the fourth and possibly the fifth I am not positive."

[Then comes the first error in interpretation which led to all subsequent ones; they are errors of interpretation rather than observation].

Detmers continues:

"The form to begin with is that of a very minute spherical body—a micrococcus. It is invariably present in the blood and blood serum in all morbid products and exudations, and in such morbid tissues as can be conveniently examined with high power objectives, when fresh. It probably is not necessary to state that the micrococci of swine plague, being spherical, do present any characteristic difference from other micrococci, if the latter happen to be about the same size as the former."

"Still, differences can be observed if the micrococci are kept under the microscope for some time (a few hours) at a suitable temperature. The swine plague micrococci soon form zooglea masses, or aggregate in clusters, and become imbedded in a comparatively viscous substance. While thus imbedded they soon commence to duplicate by growing in two opposite directions, and at the same time become contracted in the middle. This contraction gradually becomes plainer and plainer, and increases in the same degree in which the micrococcus is growing in length, till finally the latter presents the appearance of two closely connected spherical bodies without any visible partition and somewhat resembling the shape of a figure 8."

"At this stage the now bispherical micrococcus is about twice as long as its transverse diameter! ! !"

"In the interior of each spherical body a somewhat darker substance, or a kind of nucleus can be observed! ! !"

"This duplication, or process of division, which occurs in a

large number of micrococci at the same time, it seems, finally breaks the glia, or viscous mass, which apparently holds the micrococcus clusters together; the micrococci, many, or perhaps most of them, now bispherical (the real mature germ of swine plague—B) and some get single, become free and make their exit." —pp. 200, 201.

It will be readily seen by reading my own description of this germ, which will soon follow, that nothing but want of coloring the bacteria prevented Dr. Detmers from describing this organism correctly in 1880. His "bilaterial indentation" is undoubtedly the uncoloring, or transparent substance of the object described by me. There is nothing of the figure 8 appearance in the mature organism, the widest part of its body being the middle and not constricted as the figure 8 is, or as a dipplo (or double) coccus appears to be. There is, therefore, no indentation in the mature organism; but, before the separation of the two colored, or refracting ends, which Detmers terms micrococci, but for which I prefer the word sporules, this non-coloring, transparent substance becomes more extended, thinner, really presenting the appearance (in uncolored specimen especially) of an "indentation" between the two darker refracting ends of the object, until they each become isolated, round objects—micrococci—but almost instantly assume an oval form. These objects begin to swell at once, and then, by some unknown process, but distinctly a form of fission, they become separated into two coccus-like objects; by the secretion of the non-refracting and non-coloring material, which forms a band of connection between the two round, coccus-like ends, the whole making an oval organism twice as long as wide.

While there are many misconceptions in Dr. Detmers' descriptions of the biological appearances of the micro-organism of swine plague, still there is no doubt that he frequently had it under observation in 1880, though I very much doubt if he had it in a pure culture (unless by accident) from the descriptions which he, himself, gives of his methods of making his cultivations, such as:

"I charged an ounce of fresh milk, just drawn from the cow, with a mere speck of the proliferous growth of the stomach of Mr. L.'s pig. The milk thus charged and contained, in a perfectly

clean, two-ounce vial, closed by a tightly fitting glass stopper, was kept at a constant temperature of from 90 to 100° F."—p. 378, Report of the Department of Agriculture, 1879.

Anyone the least acquainted with the methods of obtaining pure cultivations of micro-organism will see that it would be next to impossible to obtain the same in any such way. Such a medium as "milk just drawn from the cow" invariably contains a mixture of germ life. There is no mention made of the preparatory cleansing and disinfection of the teats of the cow or the hands of the milker even, and the same is true of the proper sterilization of the "perfectly clean two ounce vial."

The apparent crudeness of Dr. Detmers' methods of investigation must not be attributed to any want of knowledge on his part, for it was really magnificent, considering the state of our knowledge at the time he worked, and especially when we consider the condition of instruction at the German veterinary schools at the time he studied. My admiration for Dr. Detmers' scientific abilities is still more augmented when I consider the very poor laboratorial conveniences that he enjoyed.

In introducing some quotations of his work, which at first sight would appear to be with the purpose of detracting from its value, I desire to say that my real purpose is quite the contrary. These quotations have a two-fold value:

1. They show how great the quality of his work was.

2. They show how much we have improved in the methodic of bacteriological investigation, and are also instructive as showing how errors may be avoided in the future.

Oil-immersion lenses and the Abbe condensor had not been perfected at that time, hence Detmers did his work with water immersion lenses, and he tells us with the simplicity of an honest man that one day, "January 27, in the afternoon, he filtered some pulmonal exudation from a pig that had died of swine plague, through several pieces of paper, for the purpose of freeing it from the bacillus germs which it contained. The filtering was done on a small table in the corner of the room, and the apparatus was left standing on that table with the wet papers (4) in the funnel after the filtrate had been removed. In the evening the latter

was examined under the microscope on another table in the opposite part of the room, and as my two highest objectives are immersion lenses, I had to use water, and had a tumbler full of clean water (!) on my table just drawn from the well. When through with my work, instead of pouring the water out, I placed the tumbler on another table, about four feet distant from the filtering apparatus.

Next morning I went to Chicago to return on the 30th. In Chicago I procured a new immersion lens, and about the first thing I did after my return was to try that lens.

Finding everything undisturbed in my room, and the tumbler with water exactly where I placed it, and not intending to examine but a test object, I did not go for fresh water, but used a drop of the water in the tumbler.

While adjusting the focus I discovered that the water, which I knew had been absolutely free from organic matter (! ! !) was swarming with bacilli and bacillus germs of the same kind as those in the pulmonal effusion," p. 383, Ibid, 1879.

Detmers then assumes that, as the above mentioned filter paper had dried, and during his three days' absence, that the germs in or on it had got into the air of his work-room and fallen into the tumbler of water, which had been drawn from the well, and which to a dead certainty contained micro-organism when it was drawn; it was then placed in a tumbler originally used for the purpose, which also had the same organisms on its sides to an equal certainty and left exposed to the air of his ordinary work-room for three days, which was still more certainly contaminated with any desired mixture of such organisms.

Again he says:

"On September 23 Prof. B. charged two drachms of fresh cow milk with a mere speck, smaller than a pin's head, of a decaying morbid growth, or ulcerous tumor, of the cœcum of pig No. 5, and kept the vial closed at a temperature of 92° F.

On the evening of September 20 the milk was examined under the microscope, and found to contain numerous bacillus suis and bacillus germs, the same as found in the blood serum or exudations of diseased lungs, and in the decaying substance of the intestinal growths."

Another example will suffice:

"On June 10 I took two perfectly clean (! !) four-ounce vials and put in each three ounces of clean well water, in which no bacteria, or any living thing could be found. In one vial marked No. 1, I put half a drop of the fresh pulmonal exudation of a hog that had died of swine plague," p. 385, report 1879.

The more one reflects upon such a methodic the more must be his astonishment that Dr. Detmers should arrive at such comparatively accurate ideas of the biological conditions presented by the bacterium of the American swine plague. As has been said, a pure cultivation of this organism, under such organisms, can have only been an accidental occurrence.

Even the material which I have quoted from Dr. Detmers' publications has been very carefully selected from among many vague assertions, and in some cases absolute contradictions, as may be seen from the following passage:

"The spherical, or single micrococci, undergo their first change, and develop into bispherical bodies, till the glia breaks open, when a great many bispherical schizophytæ, and also some of the spherical bodies, become free. The former (the bispherical bodies), thus freed, very soon commence to multiply by fission, but this process results in the production of bispherical, not spherical cells, or micrococci, the latter must have another origin," p. 188, report 1880.

No further evidence is necessary to show that, while Detmers at many times describes phenomena connected with the germ of swine plague, at the same time he had no distinct idea of the real vegetative phenomena of the object he was describing.

In the above quotation he contradicts himself in the most startling manner.

First he tells us that "*the spherical cells, or single micrococci, undergo their first change and develop into bispherical bodies,*" which is absolutely correct, and then he says that they do no such thing, by saying, that "*these spherical cells or micrococci must have some other origin.*"

He missed the first stage of development, that from the mature germ, or bispherical bodies, into micrococci, and describes

the second, or development of micrococci into the mature germ.

In his illustration of this organism, p. 200, *American Naturalist*, vol. 16, he illustrates the mature form more than he does the vegetative state, and gives a very fair picture, though not exact, of the organism.

(*To be continued.*)

LECTURE ON AGNOSTICISM.

By Prof. Alex. W. Stein, M.D.

This is the last lecture of this session. You will now go home and quietly review in your minds the vast field of learning which you have gone over in the several departments which constitute your curriculum, and you will ask yourselves, "What do I know?" Be sure of knowing that you do not know.

All that lies in matter and force we see "through a glass darkly." The make-up or composition of the most familiar things we know only imperfectly. Matter, of whatever kind, whether inorganic or organic, living or lifeless, we can examine only in part, for we have never been able, with the highest powers of the microscope, to make visible the atoms or smallest particles of which it is composed. We are agnostic of the relations that particles of matter hold to each other, and the forces which govern them. Separate sand into the smallest particles you can, and you will never reach the superlative degree of smallness of a molecule or silicon oxide; and when we say that each molecule consists of atoms of silicon and oxygen, we have certain reasons for the faith that is in us, but no ocular proof of the same.

In order to realize the exceedingly small size of the individual molecules, Sir William Thompson imagines a single drop of water to be magnified until it becomes as large as the earth, having a diameter of 8,000 miles, and all the molecules to be magnified in the same proportion, and then concludes that a single molecule

will appear, under these circumstances, as somewhat smaller than a cricket-ball.

Take a crystal of calc-spar; it is capable, as you know, of being decomposed into carbonic acid and quick-lime, and the inference would be that if you pass carbonic acid over quick-lime you will form calc-spar; but no; you will form lime carbonate, simply, but not calc-spar. Or take oxygen and hydrogen, pass an electric spark through them, and they disappear and a quantity of water appears in their place. There is no similarity between the properties of the water and those of the oxygen and hydrogen which have given rise to it. At 32° and below it, oxygen and hydrogen are elastic gaseous bodies, whose particles tend to rush away from one another with great force; water at the same temperature is a solid whose particles tend to cohere into definite geometrical shapes, and sometimes build up frosty imitations of the most complex forms of vegetable foliage. You say these are the properties of water, but that is all you know about it.

Again, matter may change its form, but the quantity of matter remains the same. Man can neither create nor destroy a single particle. An element is an *immortal body.* Water may disappear in vapor; wood and coal are consumed, but in these not a particle of matter is annihilated; the apparent destruction is merely a change of form. In due time the vapor becomes condensed and turns into water, and in the burning carbon the atoms in a gaseous form are brought again into a visible condition in the leaves of plants. And what is true of matter is equally true of force. Motion, heat, light and electricity are mutually convertible without loss. The conversion of motion into heat was known to our aboriginal brethren, who built their fires by rubbing two pieces of wood one against the other. The movement of the piston of a steam engine expresses so much expansive power in the steam, and this power is the expression and correlate of the heat produced by the combustion of so much fuel. Every pound of water heated one degree will raise one pound weight 772 feet, and the fall of one pound weight 772 feet will make one pound of water one degree warmer. The disappearance and in-

destructibility of force is well illustrated in the example of latent heat. If a pound of water at 32° be mixed with a pound at 174°, the mixture will have the mean temperature—that is, 103°; but if a pound of ice at 32° be mixed with a pound of water at 174°, the mixture still remains at 32°, and the reason for this is that the solid (ice) in passing into a liquid (water) requires 142° of heat. This heat is inappreciable by the thermometer. The heat energy is spent in overcoming the force of cohesion. But it is not lost, for when the liquid (water) again assumes the solid (ice) state, it is again evolved as appreciable heat. A wise provision that time is necessary for the melting of snow and ice, on the one hand, and the freezing of water on the other. Coal and wood represent the amount of force in the shape of the light and heat of the sun which was expended in their production, and when they are burnt give out again just that amount—a conversion of first visible energy into potential energy, and potential into visible energy,—a resurrection, as it were, of force buried for centuries beneath the ground.

So I might show the reciprocal relations of the physical forces by chemical action producing electricity, electricity producing heat, light and motion. Thus we know the physical forces by their effects; we know that all bodies, with a few exceptions, expand when the temperature is increased, and contrary when it is reduced. We know that there is an affinity exerted between minute particles of different kinds of matter, causing them to combine so as to form new bodies endowed with new properties. This we term electrical affinity, but there our knowledge ends. But you may say, the trouble is that the forces of cohesion and chemical affinity act through such inconceivably small intervals; but you are no better off if you take the force that acts at a great distance, viz., gravitation. You say the sun pulls the planets because it has 700 times more molecules than all the planets put together, and so it keeps them moving around it. Our earth has eighty times more molecules than our moon, and so it keeps the moon moving around it. But you cannot tell why an apple falls to the ground, except on the same unsatisfactory hypothesis.

I cite these more than familiar examples, and I am afraid you

will be tempted to say with Josh Billings, "A man had better not know so much than to know so many things that *ain't so*." But no; the only way we have of formulating our ideas is through physical laws. Take from us the faculty of philosophical reasoning, and all research and progress will stop. But I wish simply to show that spiritual agnosticism is quite in conformity with man's knowledge of material things. The material world is the shell through which we have to break to reach the kernel of *life*, *mind* and *soul*.

Let us now turn to living matter, and here we shall find a complexity of composition and of function which becomes more apparent the higher we ascend the scale of animal life. At the bottom of the sea is found a slimy, sticky substance, which, upon chemical analysis, yields carbon, oxygen, hydrogen, nitrogen and sulphur. It is so small that you place it under the microscope. It consists of an irregular spatter of semi-fluid matter, colorless, transparent, and structureless. This body, the monad, is the simplest organism with which we are acquainted; yet it is the perfect type of living matter, and although it does not display any structure, it performs the functions of the most highly organized animals, namely: motion, assimilation, sensation and procreation. This body, when completely at rest, assumes the shape of a simple sphere, and, as a rule, it is in incessant motion, throwing out delicate arms or processes; these, adhering to some portion of the glass slide, drag the body after it, and so it moves sluggishly from place to place. When a small diatom, another dweller of the sea, inclosed in a shell, comes in contact with it, it surrounds, absorbs and assimilates the nutritive portion, and rejects the empty shell. In a little while you will observe a multiplication or segmentation of the central mass, and each minute particle instantly begins a separate existence, and gradually reaches the size of the ancestral organism. If now you touch the surface with a point of a pin, or send a current of electricity through it, the threads are drawn in and the entire body contracts into the form of a spherical lump.

Now let us jump from the lowest of animal life to man. If we take a drop of blood and keep it at the temperature of the

body, there will be found, under a sufficiently high magnifying power, among the innumerable red blood corpuscles, a comparatively small number of colorless corpuscles, $\frac{1}{2500}$ of an inch in diameter, which will be seen to change their form, drawing in and thrusting out prolongations of their substance and creeping about over the slide. These amorboid movements, as they are called, are of special interest on account of the "wandering out" of these particles of protoplasm through the walls of the blood vessels, as you know they do in inflammation. But in addition to this, the absorption of small particles into their interior and the excretion of the same, is to be noted.

This living matter is to be found in all the structures of the body. As a matter of fact, the body in its earliest state is a mere multiple of protoplasmic units, which are differentiated sufficiently to inaugurate the first series of changes, and these inaugurate others in succession, until the animal is completed.

Thus throughout the vast domain of the animate world, from the monera to man, there is but one kind of actively living matter (which has been given the names bioplasm or protoplasm), and we, the highest of created beings, are but a compeer of the lowest. There is a unity of faculty and a unity of composition which pervades the whole living world, and the difference between the powers of the lowest plant or animal and those of the highest is one of degree, not of kind. Two masses of living matter, alike to the eye of sense, but not alike to the eye of reason, for one will form a dog and the other man, or from one minute germ you have the grand oak, from the other the lily. Then: "Consider the lily how it grows; and yet I say unto you that Solomon in all his glory was not arrayed as one of these."

Here, too, we see the correlation of organized beings to inorganic matter under the genial influence of solar heat and light. The plant lives upon inorganic materials, converting lifeless matter into living bioplasm, while animals live upon the plant. Thus, directly or indirectly, living organisms are linked to the globe they inhabit, and the grand Scriptural dictum, "Dust thou art, and unto dust thou shalt return," is not more philosophical than it is physiological. It expresses concisely the relations which

bind living to dead matter. In a like manner, dead or lifeless bioplasm may be converted into living. Thus, I may indulge in a fish dinner and transubstantiate dead fish into living man, and if I were to make myself accessible to them, the fish would return the compliment and demonstrate our common nature by turning my dead bioplasm into living fish.

As to the laws which govern life, scientists are divided into two classes—vitalists and physicists—or those that relegate the properties of life to a vital force independent of physical force, and those that assume that the physical forces are the only forces in the universe. It is, it seems to me, illogical to infer that the vital forces are independent of and altogether opposed to physical forces. A living organism builds itself up in accordance with natural laws, and avails itself equally of inorganic matter and physical force. Bioplasm appropriates and assimilates matter, but in doing this it does not necessarily interfere with capillarity, chemism, gravitation and osmoses.

On the other hand, it is too soon to put forth force and matter in living organisms in the same causal connection which has long been accepted for force and matter in inorganic bodies. But you will ask, with Huxley, "What justification is there for the assumption of the existence in the living matter of a something which has no correlate or representative in the not living matter?—what better philosophical status has 'vitality' in the case of bioplasm than 'aquosity' in the case of water?" To this I will put another question: What makes this matter do things while it is alive, which it cannot do when it is dead? Has the chemist or physicist ever created anything which manifests the powers of assimilation, growth, movement and reproduction? In unwrapping an Egyptian mummy, there was found a sprig of wheat which had lain with the body, it was said, three thousand years. This was planted to see if it had life, and lo! it sprouted and brought forth wheat—a resurrection of life buried for three thousand years. What a theme for our contemplation!

No; physical science has not revealed the true nature of life. All that we know is that life is an heirloom bequeathed from parent to offspring. In the language of Paul, "In Him we live and move and have our being."

Gentlemen, I would not be considered an image-breaker, who gives nothing in the place of what he destroys. It is so much easier to pull to pieces than to construct. I cannot oppose your judgment, if I would. When an argument is unreasonable, you set it aside; but if it appeals to your judgment, you are forced to accept it, whether it is acceptable or not. Prejudiced though we may be to be told that man is but a civilized monkey, we are bound to admit that the globe itself is a sublime history of evolution; and he who will read it as it is written, will be forced to the conclusion that mind existed before matter, and so the facts which I have laid before you to-day must rest.

But let us always remember that knowledge is finite. We see but the reflexion of things at best, not the things themselves. Knowledge is within our grasp; it deals with matters tangible, but faith is infinite, and leads us into the boundless realms of the imagination. What is imagination? You will not deny its existence, though you cannot give the correlate for it in physical force.

One thing we may take upon inference: that if neither matter nor force can die, it would be a great anomaly in creation if the principle of *conscious identity* were capable of utter annihilation. Then—

> "So live that when thy summons comes to join
> The innumerable caravan which moves
> To that mysterious realm where each shall take
> His chamber in the silent halls of death,
> Thou go not like the quarry slave at night,
> Scourged to his dungeon, but sustained and soothed
> By an unfaltering trust, approach thy grave
> Like one who wraps the drapery of his couch
> About him and lies down to pleasant dreams."

New Appointment.—Dr. C. J. Alloway, formerly of Montreal but now of Grand Forks, Dak., has been appointed Territorial Veterinarian under the law passed by the late Dakota Legislature. The appointment seems to meet with unanimous approval.

GLANDERS.

By Veterinarius.

A Contribution for the Prize offered by the U. S. Veterinary Medical Association for Papers published in the American Veterinary Review.

(*Continued from page* 16.)

Dr. Loeffler's next experiment was to develop cultures from the greatest number of glandered horses possible, and see if the same micro-organism would invariably develop. The first horse examined presented, besides other symptoms, an exquisite case of chronic glanders in the spleen and liver. Cultivations were made from the liver and spleen. Those from the liver did not yield many colonies, but what it did were very characteristic; the splenic cultivations remained sterile. Bacilli could not be demonstrated in the tissues by any method of colonizing. Experiments and examination of the organs of another horse gave more satisfactory results, the characteristic bacilli being easily found when subjected to the methyl blue process as already mentioned. Cultivations gave the previously described yellow vesicles. The third horse presented the phenomena of acute glanders in optima forma both in the septum nasi and lungs. In cultivations from the lung nodule in blood serum the development was so profuse that the surface appeared as if covered with a yellow transparent coating; the single vesicles could only be distinguished at the edges. The characteristic bacilli were easily demonstrated in sections of the ulcers and pulmonary noduli. A fourth horse, which was very old, presented chronic ulcerations with indurated edges in the septum nasi, the cartilages being necrotic underneath. Tough fibrous noduli, many of which were calcified, were found in the lungs; the liver was also the seat of large noduli, the centre of which had undergone puriform softening. In this case cultivations were made from nodules from the liver as well as the lung, in order to guard against contamination from without. In this case the yellow vesicles again developed on blood serum, but in small colonies, as in the first case of chronic glanders, a result that was anticipated from the age of the neoplasms.

It now became a matter of great importance to demonstrate the presence of the same bacilli in the organs of other animals that had been inoculated with material from glandered horses and acquired the disease beyond all doubts. Rabbits inoculated with fresh material in the ear and abdomen did not present the symptoms of general infection, an ulcerative process only developing at the locus inoculationis. The eventual demonstration of the bacilli in the peripheries of ulcerations, standing in direct relation with the external world, could not be of a pathogenic value, as an objection could be raised that they had gained access to the tissues from without. In guinea-pigs the conditions were quite different, as in them not only were local processes developed, but a thoroughly characteristic infection of the internal organs followed the inoculation. Illustrated by the following examples:

First case. A portion of an old glanderous nodule from a horse was introduced under the skin of a guinea-pig, and in fifty days the animal died. Autopsy: Long, fluctuating tumors on the left axilla; spleen studded with numerous greyish-yellow miliary noduli, as well as the liver, though the neoplasms in the latter were much smaller than in the spleen, and of a grey color. The left suprarenal capsule contained a yellow node, as did also the epididymis of the same side. One of the retroperitoneal glands was hypertrophied, as large as a cherry, and filled with a delicate, greenish-white puriform material. The nasal cavities were filled with a purulent mass, the mucosa being ulcerated in many places. Similar results do not follow the artificial inoculation of guinea-pigs with other infectious material or any natural disease to which they are subject, therefore the above disease cannot be considered as any other than glanders. In covering glass preparations from the nodules of this guinea-pig, as well as sections from the tissues treated with methyl-blue, the same fine bacilli were recognized as demonstrated by the cultivating methods.

Second case. A guinea-pig was inoculated in the posterior abdominal region with fine particles of a glanderous neoplasm from the lung of a diseased horse. The animal died in twenty-seven days. Autopsy: Ematiated rough coat; axillary and inguinal glands of the right side swollen and fluctuating; on section a

greenish-white fluid oozed out. The inguinal glands of the left side were also swollen and full of yellow centres. Spleen enlarged; liver in a similar condition; both filled with greenish noduli. Kidneys intact. Lungs contained greyish-red neoplasms. Testicles both hypertrophied, the inner and outer membranes being adherent. Left foot swollen, and on cutting through the skin a purulent material escaped. Left side of the septum nasi ulcerated and covered with crusts. The presence of bacilli in the numerous tissues left no doubt as to the nature of the disease.

The third case gave the same results.

These cases were selected from a great number of animals that were subjected to experimental inoculation, and show that guinea-pigs inoculated with glanders material develop a very characteristic disease, and that the same specific micro-organisms were produced as occur in equine glanders, as demonstrated by microscopic examination and cultivation experiments.

Dr. Loeffler's next experiment was to show that the bacilli thus derived and cultivated from glanders noduli and products were not accidental occurrences in the disease, but the actual etiological moment, and that the disease itself could also be generated by inoculations from pure cultivations of the micro-organisms. Eight days after a cultivation of glanders material had been sown upon blood serum, a small quantity was taken up upon a previously heated platinum wire and reinoculated upon fresh material. Eight days later another cultivation was again made in the same manner, and twelve days later another. It was assumed that none of the original organisms were present in the fourth generation. The cultures consisted of nothing but the previously considered fine bacilli. Thirty-six days from the time the first cultivation was sown some of the material from the last cultivation was mixed with a small quantity of sterilized blood serum and inoculated into the Schneiderian membrane and both shoulders of a horse apparently free from any symptoms of glanders. The syringe used for the experiment was sterilized by exposure to 160 deg. C. The animal's temperature began to rise within forty-eight hours, measuring 39.5 deg. C. in the rectum. One could feel a small elevation at the locus inoculationis. An ulcer

developed at this point in a few days and gradually increased in extent, and encroached upon the underlying tissues; the base of the ulceration presented a grey, lardaceous appearance, and secreted a greenish-yellow mass which stuck to the edges of the nasal opening. From the point of inoculation on the shoulders there issued at first a yellowish, then greenish-yellowish, viscid fluid which adhered to the hairs as it flowed over them; a lymphatic cord the size of one's finger extended from the nasal ulceration to the corresponding intermaxillary gland. Similar cords were present on the shoulders extending to the axillary glands. In two weeks the animal presented all the characteristic clinical phenomena of *acute* glanders. However, contrary to expectation, the animal gradually improved, and instead of secondary ulcerations developing in different parts of the body, the fever ceased, the ulcerations did not extend, and finally manifested a tendency to cicatrization; the hypertrophied lymph glands became smaller, so that at the end of four weeks doubts arose as to whether the above phenomena could be considered as belonging to glanders. Dr. Loeffler concluded to kill the horse, in order to observe the internal conditions. The autopsy caused considerable astonishment. Upon the septum nasi, as well as in the immediate tissues between the nose and pharynx, numerous whitish and radiating cicatrices were found; the lungs presented old fibrous and calcified nodes of varying dimensions, as well as fresh noduli of variable size, surrounded by red rings. At the root of the lung a large noda surrounded a bronchus, which, on section, had a yellow appearance, its surface being studded by a number of miliary greyish neoplasms, situated in a yellow gelatinous substance. A radiating cicatrix was present at the locus inoculationis in the septum nasi; the products at the same point on the shoulder were about the size of a hazel nut, and contained a yellow caseous material. The intermaxillary and axillary glands were somewhat larger than normal. All these conditions indicated that the animal was the subject of a glanderous infection for a long time prior to the above inoculation, and the time of this experiment did not show any suspicious indications of any such complications.

The above experiment being of no pathological value, owing

to the animal being already afflicted with glanders, a renewal of the experiment was necessary.

The subjects were a healthy horse, 20 years old, and one 2 years old. The old horse was inoculated with virus from a pure cultivation of the original material in the tenth extra organismal generation. The young horse was inoculated with a culture of the fifth generation, that was made from the testicle of a guinea-pig that died 24 days after being inoculated, and which had been inoculated with the fourth generation of the original material. In order that the inoculation of these horses should be as severe as possible, the material was introduced in considerable quantities in both shoulders, the breast, flank, and the back of the nose. Nothing was injected into the mucosa of the nose, in order to see if secondary eruptions would develop in the same.

In a few days, at the locus inoculationis, a diffuse œdematous tumefaction was to be seen. The animals ate poorly, were stiff in their movements, and had staring coats. In the course of eight days the tumefactions opened and secreted a cloudy greenish-yellow material. On the 12th day an ulcer appeared on the forehead of the younger horse, about the size of a quarter-dollar, penetrating to the bone, with irregular indurated edges. In both animals a nasal secretion appeared, which desiccated in thin, dry crusts upon the wings of the nostril, and, finally, development of ulcerations in the mucosa of the nasal cavities, which placed the glanderous nature of the iuduced disease beyond all question.

Both animals became daily more and more emaciated. The elder died first.

The following is the result of the autopsy: At all the points of inoculation, ulcerations the size of a quarter of a dollar and larger, were present; the same were covered with thick crusts of dessicated secretions and hairs; they secreted a yellowish-white material. The soft tissues beneath these ulcerations were degenerated, and almost in a fluid condition; the surrounding subcutis was infiltrated with a purulent material. The ulcerations in the neck were in connection with lymphatics that formed cords extending to the axillary lymph glands, which were as large as a hen's egg, their cut surface presenting numerous small yellow

centres. Swollen lymphatics were also present at the other seats of ulceration, and could be traced to the adjoining lymph-glands, which were swollen, and also presented yellowish-white centers. There were numerous ulcerations with swollen indurated edges in the mucosa of the nose, and at the base of the ulcerations numerous gray or yellow noduli were to be seen. The submaxillary glands contained nodules the size of a bean, full of yellowish centers. The mucosa of the anterior face of the epiglottis contained an ulcer about the size of a ten-cent piece, with jagged, indurated edges. Numerous noduli of various sizes were present in the lungs, the larger being formed by a confluence of smaller ones composed of grayish clouded centers, surrounded by a reddish circle of tissue. Noduli were also present in many muscles of the body, and also nodes filled with a yellowish-white or grayish material, which in some cases assumed a fluid character. The results in the older animal being so confirmatory, it was resolved to kill the younger one, which at this time was very much emaciated. The following is the result of the autopsy: Extensive ulcerations of the point of inoculation, yielding a profuse yellowish-white secretion; the ulcers on the back of the nose were about the size of a silver dollar, and extended to the underlying osseous tissue; a somewhat smaller ulcer was present over the frontal bone, its base being covered with a hæmorrhagic mass. Several small ulcers were also present on the skin of the near hind leg, and one on the sheath. The ulcers on the neck were connected with the axillary glands by lymphatics of great thickness, with nodular enlargements along their course. These noduli were partly within and partly external to the vessels, and contained a puriform fluid. The axillary glands were soft in consistence, and about the size of a hen's egg, and numerous grayish-yellow centers existed in their substance. The ulcerations on the walls of the thorax extended through the skin into the muscles, and swollen indurated lymphatics could be traced leading from them to the axillary glands. The ulcers in the flanks were flat, and the adjoining tissues much infiltrated. The right axillary gland was soft and about the size of a hen's egg, vascular and reddish in color. The left was not so much swollen. The subcutaneous

tissue of the sheath was of a gelatinous character, and the lymph glands in and around it were hypertrophied. Extensive cavities were observed in a number of muscles, filled with a clouded fluid of a yellowish-white color. The nasal mucosa were filled with numerous noduli and ulcerations, the former being gray or yellowish in color. The surrounding mucosa was hyperæmic and red; the edges of the turbinated bones were complicated with these productions; no ulcerations were present in the mucosa of the pharynx, larynx, trachea and bronchial tubes. The submaxillary glands were as large as a walnut and exceedingly indurated, but not attached, and on cutting them numerous yellowish-white neoplasms were observed. In the lungs six small noduli were found, surrounded by a somewhat dense parenchyma and hyperæmic tissues. The adjoining lymphatics were enlarged. Spleen hypertrophied, soft, and of a dark-brown color. The liver, kidneys, heart and muscles presented nothing abnormal beyond a slight cloudy swelling.

The clinical as well as the microscopical phenomena permitted of no doubt as to the nature of the induced disease. The characteristic bacilli were present in the tissues, and cultivations from both of the above animals.

To test the question further, a number of guinea-pigs were inoculated with fresh material as it was taken from the horses. One of them, inoculated with material from the old horse, died in 15 days. The autopsy and microscopic examination of the neoplastic products gave full evidence of the nature of the disease. Similar results followed in each of the animals inoculated.

These investigations led to the following results: That in the specific products of a typical case of glanders in the horse, and the neoplasmata produced in guinea-pigs inoculated with material from such a horse, a bacillus was found which can be demonstrated by traction, and especially by cultivation upon blood serum. Pure cultivations of many generations caused glanders in horses and guinea-pigs upon inoculation, which is sufficient proof that those bacilli are the etiological moment in glanders.

Shortly after the publication of the above experiments, Bonchard, Capitan and Charrin published results of similar studies.

The French investigators did obtain infecting cultures from glanders material, but were unsuccessful in obtaining pure cultures of the same.

Israel published the results of similar investigations. He succeeded in three cases in cultivating bacilli from the pulmonary noduli of glandered horses, and describes said bacilli as somewhat thicker than tubercle bacilli, but easily distinguished from the latter by the great dimensions of the spores. Israel induced a disease in rabbits with his cultivated bacteria, which Dieckerhoff declared to be glanders. It is singular that he succeeded in coloring his rods in tissues used in the ordinary manner.

Wassiliff demonstrated the presence of the bacilli described by Dr. Loeffler in the blood and postules of a man affected with glanders, by the methyl-blue method.

The most confirmatory evidence was given by Kitt, of Munich, and Weichselbaum.

One of the first and most essential tasks in the study of any pathogenic organism consists in discovering what species of animal is most open to infection, in either a natural or artificial manner; that is, possesses a sort of biological affinity for such micro-organisms. It is necessary to find such animals among the smaller and cheaper varieties, which thus act as a sort of reagent for such organisms as was shown in the study of anthrax. The horse and ass are the animals which are open to infection with glanders, especially the latter. The high cost of these animals, and the difficulty of providing suitable locations for the study of the disease in them, the removal and care of such large cadavers, renders it necessary in experimentation only to resort to such animals in the most important and test cases, while for ordinary studies to have recourse to mice, rats, rabbits and guinea-pigs.

TRANSMISSION OF GLANDERS TO OTHER ANIMALS WITH PURE CULTIVATIONS OF THE BACILLI.

The number of animals of different species in which either natural or artificial glanders has been observed, induced or attempted, is by no means small; it includes the solipeds, ruminants, omnivora, carnivora and rodents, and experiments were

even attempted with fowl. Cattle possess a natural immunity from glanders infection. Gerlach repeatedly inoculated two calves and a one-year old steer with the nasal secretion from a glandered horse, but with no effect. Hertwig reports five experiments with similar results. In 1843, Wirth experimented with a buck goat, but as secondary inoculations were neglected, the case requires the necessary confirmation.

In 1861, Ercolani records the case of a goat kept in a stable in which five horses had become glandered in the course of fifteen months. The lesions were in the udder, a viscid nasal secretion, abscess on the swollen intermaxillary gland, and small noduli in the lungs.

In 1875, Karsten Horne reported a case similar to the above.

Hertwig reports the death of one out of three goats on the 18th day after inoculation with glanders material. The autopsies confirmed the clinical phenomena.

Bollinger reports positive results of the same nature.

Trasbot also mentions a case of the natural infection of a goat in a stable in which there were several glandered horses.

Judge Mason, of Lincoln, Nebraska, recently brought a very doubtful case to the happy conclusion of saving both parties in a horse sale case from an expensive lawsuit, by inoculating two sheep and two goats from the visible ulcerations in the nasal cavity of a glandered horse. Before the case was called, the four inoculated animals died, with unmistakable symptoms of glanders. I may state that the case did not come on, as the defendant settled.

Sheep are not so sensitive to infection as goats. Viborg reports his efforts in this direction as unsuccessful. Renault and Bouley were more successful, and produced glanders in two sheep inoculated by them. Gerlach produced glanders in a sheep fifteen days after inoculation.

Swine seem to possess a natural immunity from glanders, so far as can be determined from existing evidence. Numerous experiments have been recorded with animals belonging to the orders carnivoræ and rodentiæ, but the results were contradictory and unsatisfactory.

Dr. Loeffler experimented with pure cultivations of the bacilli.

He inoculated two rabbits on the inner part of the ear, and in five or six days observed an infiltration at the locus inoculationis which soon became ulcers with a grayish lardaceous base; the corresponding glands at the base of the ear became swollen, the suppuration gradually ceased in one of the rabbits, leaving only an œdematous condition of the tissues. In the other animal the ulcerations gradually increased, and numerous gray nodules appeared in their circumference and soon underwent purulent dissolution. These ulcerations were covered by a yellowish scab from beneath which a purulent fluid could be pressed. Pustulous eruptions also appeared in different parts of the body, but they soon healed. The animal became emaciated, and a snuffling respiration, with a nasal secretion, was observed, leading to the conclusion that the animal was undoubtedly affected with glanders. Both animals were killed five weeks after inoculation. In the first a dough-like mass was found at the locus inoculationis, the lymph-glands in the vicinity of the ear were swollen, but no neoplasmata were to be seen in the vicinity of the cut surface. In the posterior lobe of the left lung, which was attached to the thorax, was a large tumefaction with a nodulated surface and caseous contents; the other parts of the lungs were free from any complications. The bronchial lymph-glands were swollen and hyperæmic. The encapsuled caseous center should not be considered as a product of glanders infections, as such conditions are a frequent occurrence in rabbits, but they have been recorded as a participating phenomena in glanders.

In the second animal, besides the already described changes in the ear, the lymph-glands on the head, neck and axilla were enlarged, but free from noduli. In the lungs a few isolated gray noduli could be seen. The spleen was enlarged and of a reddish-brown color. The mucosa of the septum nasi of the right side presented a small ulceration with swollen edges and lardaceous base, underneath which a number of small noduli were about to conglomerate; the adjoining tissues were very hyperæmic.

In order to see if the injection of pure cultivations of glanders bacilli into the circulation of rabbits would produce a general infection of miliary noduli, as is the case in tuberculosis, a subcu-

taneous syringe-full of such material was injected into the aural vein of two rabbits. On the fourth day many gray noduli developed at the locus inoculationis. One animal was killed on the fifth day, to see if the local results were accompanied by similar complications in the internal organs, but they were unaffected. The second rabbit was found on the twelfth day in a very emaciated condition; besides noduli at the locus inoculationis, numerous submiliary neoplasmata were found in the spleen and liver. The parenchyma of the spleen was in a condition of cloudy swelling. No noduli were present in the pulmonary tissue; petechial hæmorrhages were dispersed throughout the pleuro-pulmonum. A small lenticular ulcer was found on the right side of the septum nasi, and a few submiliary noduli on the mucosa of the turbinal bones. Glanders bacilli were demonstrated in these neoplasms. The diagnosis of acute miliary glanders was thus confirmed. Dr. Loeffler did not experiment further with rabbits, as guinea-pigs were demonstrated to be a much more susceptible and practical animal for such purposes.

(*To be continued.*)

REPORTS OF CASES.

FRACTURE OF THE SKULL FROM THE KICK OF A MULE.

By Benj. McInnes, Jr., M.R.C.V.S.

(Paper presented to the United States Veterinary Medical Association.)

On February 28th, 1887, I was requested to go to the Clausen Brewing Company's stables to see a dead horse. On my arrival I found the proprietor, who related the history of the case as follows:

He found the horse restless in the stall, and having no work to do that day, his owner being away, he turned him into a small enclosure, in which there was also a mule. About fifteen minutes afterwards the stableman passed near the enclosure, and saw the horse suddenly drop on his haunches, lie over on his side, and die without a struggle.

I was sent for to determine the cause of death. I found him lying upon his left side, and there was no external sign by which I could discern the cause of death.

This occurred about 8 o'clock A. M. I made an autopsy at 3 P. M.

I severed the left fore leg from the trunk, and noticed that the blood was very dark and fluid; opened the chest, and found the lungs and heart in health; liver, kidneys and intestines healthy. I then removed the head from the neck, and dissected the skin back over the parietal and frontal bones. As soon as this was done, I noticed a large blood-clot over the right orbit, and, on removing the muscles, a fracture of the skull was revealed.

There was no abrasion of the skin over the seat of injury. A space of clotted blood, about two inches square, was found upon the brain. The fracture was evidently caused by the mule having kicked him.

OSTEO-SARCOMA.

By the Same.

The subject of this paper was the thoroughbred stallion Pacific, by Hunter's Lexington, dam by Capt. Beard. I mention this to show that, in so far as I know, there has been no cancerous diathesis in his family.

The notes on the case are as follows:

On January 15th, 1887, I was requested by Major T. G. Barker, who purchased Pacific from Mr. Chas. D. McCoy (both of Charleston, S. C.) on December 1st, 1886, to prescribe for said horse, who, he said, had a running from the nose, which was thought by Mr. McCoy, whom he had consulted, to be distemper. I was also to visit the horse at his home, at my earliest convenience. Having an engagement to go to Augusta, Ga., the following week, I was unable to see the horse until January 25th.

At this date I noticed the following symptoms: Slight catarrh from both nostrils; right side of face much enlarged, involving the nasal, superior maxillary and zygomatic bones. The eye was not affected in any way, nor was there any protrusion of the orbit. On opening the mouth to examine the teeth, a very

fœtid odor was detected, and slight hæmorrhage apparent. Breathing somewhat rough; condition and spirits good.

I thought that some disease of the molar teeth had caused the swelling, and recommended the owner to send the horse to my place in Charleston, where I could more carefully examine and watch the case.

The horse was brought to my stable on January 29th, 1887, and confined in a narrow stall during that night. Next morning his manger was covered with blood.

I then placed him in a large pen, to make him as comfortable as possible. His appetite was very good, and he masticated his oats without difficulty. The catarrh from the nostrils was thick and very offensive, and the hæmorrhage from his mouth profuse —in fact, exhaustive. When dressing the mouth every morning, large organized blood-clots would be washed out, and many would be found about his stable.

On opening the mouth with the speculum, nothing wrong could be seen about his teeth. When cast for this examination, and while the speculum was in his mouth, his breathing was impaired almost to suffocation.

A few days after this, I noticed two ulcerated spots upon the superior border of the tumor; these burst, and there issued therefrom thick pus, tinged with blood and very fœtid. These symptoms continued to become more aggravated.

After being here about a week, his appetite began to fail him, and it was with great difficulty that he could masticate his hay. He lost flesh, and seemed to be going down very fast. I told Major Barker that I thought it was a malignant tumor, known as osteo-sarcoma, but could not say positively as to its exact character until cut into.

I cast the horse on February 17th, 1887 (chloroform or ether, from the condition of the horse, being inadmissible), and with the assistance of Dr. J. J. Edwards, M.D., removed about three and three-quarter pounds of the tumor, which proved to be as diagnosed. The four last molars were involved in the tumor, and were picked out with our fingers. The tumor extended well into the nasal cavity, and as far back as the ethmoid bone. The

wound, after operating, was very large, extending through the buccinator muscle and exposing all the molar teeth of the right side. The lower lip was paralyzed, and deglutition completely suspended. He remained in this condition until February 23d, when he died.

The hæmorrhage during the operation was very great, although no very important vessel was cut except the submaxillary vein. I ligated the temporal artery before starting to operate, to assist in controlling hæmorrhage.

This paper is communicated to illustrate the rapidity of the growth of the tumor, and to get an expression of opinion as to where the responsibility lies.

AMERICAN VETERINARY HOSPITAL.

REPORTS OF CASES.

VESICAL CALCULUS—URETHROTOMY WITH COCAINE.

By Dr. J. Huelsen, Jr., D.V.S., House Surgeon.

The subject was a gray gelding, seven years old, which for some time had shown symptoms of frequent attempts at urination, or straining violently. These efforts were accompanied by slight colicky pains and a slight dropping of a few drops of urine from the sheath. The urine, collected in a graduate, was thick, and contained a large amount of mucous and a few striæ of blood. Rectal examination confirmed the suspicion of a stone in the bladder, the foreign body being detected movable, and about the size of a hen's egg.

The principal interest of this case rests on the great advantage that was derived from the use of cocaine as a local anæsthetic in the steps of the operation for the incision of the urethra.

Ten drops of four per cent. solution were injected above and below the ischial arch, and the operation performed in the standing position. The hind legs being hobbled, and a twitch placed on the animal's upper lip, an incision was made on the median

below the arch and kept until the urethra was entered, without the animal exhibiting the slightest pain. A pair of dog obstetric forceps being introduced into the bladder, the noise that it made in coming in contact with the stone rendered the diagnosis positive. An assistant then introduced his hand into the rectum, and, grasping the calculus, pushed it back between the jaws of the forceps, where, it being firmly held, it was with much traction removed, the animal showing scarcely any pain as the large body was extracted. The calculus, when fresh, weighed over six ounces, and measured 5½ inches on its small and 6 inches on its larger circumference. Its external surface was somewhat rough, and its structure analagous to those of a similar nature. The animal was discharged convalescent in a few days, the wound being left alone and cleanliness being the only after cares of the operation.

EMBOLISM OF THE ILIAC OF BOTH SIDES.

By H. B. Ambler, Student.

Through the kindness of Dr. G. Bridges, this patient was sent to the hospital for the benefit of the students and for post mortem examination.

Admitted on the 18th of March. The animal was a roan mare, about nineteen years old, which for the last six months had shown peculiar lameness. Whenever driven for about half a mile she would get lame, perspire profusely, her respiration became hurried, her pulse very weak, and then she would lie down in great pain. She had been treated for colics and for azoturia, but as she would recover from these attacks so quickly—viz., as soon as she had thoroughly cooled off—these diagnoses were considered as incorrect.

As the history of her case led to suspicion of embolism of the iliac arteries, a rectal examination was made when she was cold, and a weak pulsation detected on both sides. She showed cramps, however, on the right side.

On the 24th of March she was taken out of the stable and exercised. She had gone but a short distance when the cramps

of the off hind leg seemed to pass off, and for a little time she moved quite freely. After about 15 minutes' exercise she was taken lame on the near hind leg, and a little later on showed manifestations of great pain in both hind extremities. After half an hour's exercise her pains were such that she wanted to stop, and did so in spite of all efforts, which were quite freely used.

Brought into the stable and standing still, her pulse was found beating rapidly, her respiration was short and quick, her temperature slightly increased. She sweated profusely, and her legs alternately raised in a spasmodic, lancinating manner, both of them showing a marked lower temperature below the hock. Examined again by rectum, but very weak pulsation could be felt on the tract of the left iliac artery. The diagnosis being made, the animal was destroyed and a post-mortem made under the supervision of Dr. Bridges. It was then found that the posterior aorta, near her quadrification, was partly closed by a large clot of blood which extended into the left iliac, and could be traced down in the femoral as far as the femoro-popliteal artery. On the right side a clot existed also, but smaller, and not extending as low down as in the left artery.

COMMENCEMENT EXERCISES.

MONTREAL VETERINARY COLLEGE.

The Montreal Veterinary College and the Council of Agriculture celebrated the closing of the season for 1887, at which there was a large attendance of the pupils and their friends.

Mr. Blackwood, chairman of the agricultural committee of the Council of Arts and Agriculture, presided. There were also present Prof. McEachran, Dr. Lecreo, secretary Council of Agriculture; Mr. Casgrain, Dr. Bryden, of Boston, and Dr. Gadsden, of Philadelphia.

THE REPORT.

The following students registered during the past session· W. J. Torrance, Ottawa; A. S. Lamb, Montreal; Thos. E. Feron,

Montreal; Wm. Walsh, Huntington; E. W. Wieland, Buffalo; John A. Miller, Stony Lake, Ia.; D. J. Mullin, Montreal; Frank A. Miller, Granby, P. Q.; G. C. Becket, Montreal; John H. Roberts, West Shefford, P. Q.; E. L. Bateman, Tilston, Eng.; H. D. Smith, Montreal; W. B. Abbe, New Bedford, Mass.; H. McWhinnie, Ormstown, P. Q.; Jas. W. Harwood, Bloomington, Ill.; R. H. Macfarlane, Montreal; R. A. Vannest, Minneapolis, Minn.; F. C. Vancor, Knowlton, P. Q.; A. M. York, Detroit, Mich.; J. Henderson, Prince Edward Island; J. D. Murphy, Montreal; J. F. Pease, Quincy, Ill.; M. E. Chapin, Springfield, Mass.; F. W. Skaife, Montreal; George S. Baker, Dunham, P. Q.; G. P. Dillon, Montreal; John McCurdy, Ormstown, P. Q.; Mark A. Dawes, St. Annes, P. Q.; Robt. Austen, Dunham, P. Q.; W. E. McGarth, Allans Corners, P. Q.; J. H. Goddard, Adamsville, P. Q.; A. R. Rowat, Manotick, Ont.; R. Darling, Montreal; J. Meldrum, Montreal; J. G. Harris, Moosimin, N. W. T.; J. M. Parker, Massawippi, P.Q.; M. W. Simpson, Fulton, Mo.; C. R. Simpson, Columbia, Mo.; J. Robertson, Howick, P.Q.; H. R. Macaulay, Broadway, N.W. T.; M. Munro, Lancaster, Ont.; Jas. B. Paige, Prescot, Mass.; M. L. Miner, Abercorn, P.Q.; F. T. Metcalf, Buffalo, N. Y.; W. H. Craig, Dominionville, Ont.

EXAMINATIONS.

The students passed examinations in order of merit as follows:—

Botany (D. P. Penhallow, M. A. professor)—Darling, Harris, Chapin, Vannest, Bateman, Austin, McWhinnie, Wieland, York, Simpson, Parker, Dillon, Harwood, Henderson, Mullins, Meldrum, Goddard and McCurdy.

Histology (Geo. Wilkins, M.D., professor)—Pease, Macaulay, Harwood, Baterman, York, Miller, J. McCurdy, McWhinnie, Paige, Vannest, Wieland, Austin, Darling, Chapin, Harris, M. Simpson, Skaife, Munro, Goddard and Henderson.

Chemistry (G. P. Girdwood, M.D., professor)—Pease, Miller, J. Dawes, Macaulay, Feron, Paige, Robertson, Munro, McGarth.

Physiology (T. Westley Mills, M.D. professor)—Torrance,

McGarth, Becket, Paige, Robertson, Roberts, J. Miller, Vannest, Baker, Smith, Munro and Dawes.

Materia Medica (James Stewart, M.D., professor)—Paige, Munro, Becket, Pease, McGarth, Smith, Vannest, Macaulay, Dawes, Meldrum, Roberts, Robertson.

Cattle Pathology (Charles McEachran, V.S., professor)—Torrance, Rowat, F. Miller, C. R. Simpson, Feron, Murphy, Baker and Craig.

Anatomy (Mr. C. Baker, V.S., professor)—Torrance, Rowat, F. Miller, Feron, Murphy and C. R. Simpson, equal, and Baker.

General Pathology, Practice of Veterinary Medicine and Surgery (D. McEachran, F.R.C.V.S., professor)—Torrance, Rowat, Feron, F. Miller, C. R. Simpson, Baker and Metcalf.

Final oral examination by the board of examiners appointed by the Council of Agriculture, consisting of Messrs. J. W. Gadsden, M.R.C.V.S., of Philadelphia; Williamson Bryden, V.S., Boston; J. A. Couture, V.S., Quebec; Arch. McCormick, V.S., Ormstown, Que.; A. W. Harris, V.S., Ottawa; Geo. Leclerc, M.D. The following students passed: Messrs. Torrance, Rowat, F. Miller, Feron, C. R. Simpson, and Baker.

The diplomas and prizes were distributed by Dr. Leclerc. The following gentlemen having attended the prescribed three sessions and passed the written and oral examinations in botany, physics, histology, chemistry, physiology, materia medica, anatomy, cattle pathology, general pathology and practice of veterinary medicine and surgery, received the diploma, viz.: Messrs. Torrance, Rowat, F. Miller, Feron, Simpson and Baker.

The following is the prize list:

SENIOR CLASS.

For the best general examination in all subjects, a silver medal, the gift of the Council of Agriculture, won by W. J. Torrance.

Practice of Veterinary Medicine and Surgery—1st, W. J. Torrance; 2nd, A. R. Rowat.

Cattle Pathology—W. J. Torrance.

Anatomy—W. J. Torrance.

SECOND YEAR.

Practice of Veterinary Medicine and Surgery—1st, H. R. Macaulay; 2nd, John Miller.

Cattle Pathology—Jas. B. Paige and H. R. Macaulay, equal.

Anatomy—J. F. Pease.

Materia Medica—1st, Jas. B. Paige; 2nd, M. Munro.

THE ONTARIO VETERINARY COLLEGE.

The closing exercises of the Ontario Veterinary College were held at Toronto, on March 31, in the spacious lecture-room of the college in Temperance Hall, which was crowded to the doors with students and visitors. Among those present were Lieut.-Governor Robinson, President Wilson, of the University of Toronto, Mayor Howland, and other distinguished personages. The Lieut.-Governor and several others present assisted in the distribution of prizes, the exercises being presided over by Mr. Andrew Smith, V.S., President of the college.

THE GRADUATES.

The following is a list of those successful in the examinations:

Alexander, C. F., Hoosac, N. Y.
Austin, E., Simcoe, Ont.
Barnes, A. S., Fingal, Ont.
Beardsley, C. D., Union Springs, N. Y.
Beatty. —
Black, J. B., Brampton, Ont.
Blackwell, J. E., London, Ont.
Booker, J. C., Jerseyville, Ill.
Bowler, J., Amherstburg, Ont.
Brady, L. R., Manhattan, Kan.
Brown, J. E., Wilmington, O.
Buskirk, J. D., Bradley, Mich.
Carter, O. J., Toledo, O.
Carmichael, W., Seaforth, Ont.
Chamberlain, H. D., Waterloo, Ind.
Chase, C. G., Consecon, Ont.
Coffin, E., Monticello, Ill.
Cook, J. W., Clinton, Ont.
Coseford, S. E., Hollin, Ont.
Clarke, J. G., Little Britain, Ont.
Clark, W. F., Goderich, Ont.
Craig, R. L., Hamilton, Ont.
Creamer, J., Belmont, Ont.
Crosby, M. H., Uxbridge, Ont.
Culp, J. J., Orangeville, Ont.
Curphey, J. M., Rochester, Ind.;
Davidson, H. H., Burlington, Ont.
Dodds, W. G. K., Toronto.
DuBois, G. B., Nicholson, Pa.
Dyer, W. O., Belmont.
Evans, J. S., Chelsey, Ont.
Fee, H. A., Tiverton, Ont.
Fitzgerald, G. J., Lucan, Ont.
Fletcher, B., Oxford Mills, Ont.
Foos, A. C., Reading, Pa.
Fry, H. W., Dunnville, Ont.
Gardenier, W. J., Quincy, Ill.
Grime, J. R., Blackpool, Eng.
Gibson, J. I., Kemptville, Ont.
Giffin, W. A., Mayfield, Ont.
Gillin, J. R., Belleville, Ont.
Good, C. R., Williamsport, Pa.

Grainger, M. R., Thamesville, Ont.
Goulding, J. H., Greenville, Mich.
Harris, J. G., Ashburn, Ont.
Harston, C. S., Westminster, Md.
Henderson, D., London, Ont.
Hinebauch, T. D., Vicksburg, Mich.
Hoffman, N., Buffalo, N. Y.
Holland, R. G., Wellington, O.
Hollister, F. B., Montrose, Pa.
Hollingsworth, C. E., Hillsborough, O.
Hopkins, W. H., Green River, Ont.
Howes, B., Carleton Station, N. Y.
Hutchins, A., Stratford, Ont.
Hunter, S. L., Bath, N. Y.
Hunt, F., Jamestown, N. Y.
Jeffrey, F. M., Wis.
King, D., Toronto.
King, J., Dresden, Ont.
King, T. A., Brampton, Ont.
Kiteley, B. W., Sharon, Ont.
Klicker, H. C., Clarence, N. Y.
Kline, J. J., Allentown, Pa.
Lavery, J. F., Uxbridge, Ont.
McDermott, T. W., Le Roy, O.
McFadden, A., Dunlain, Ont.
McKenzie, A., Port Perry, Ont.
McLean, L , Alliston, Ont.
McMillan, J. L., Vernon River, P. E. I.
Murtry, J. C., SouthMarch, Ont.
McTaggart, A., Nassageways, Ont.
McClintock, J., Galva, Ill.
McVicar, J. D., Poplar Hill, Ont.
Morgan, G. E., Chicago, Ill.
Moore, J., Plainfield, Ont.
Notman, C. R., Toronto.
Nicholls, W., Uxbridge, Ont.
Nichols, S., Cobourg, Ont.
Nugent, O. F., London, Ont.
Orr, S. C., Riley Centre, Kan.
Orr, L. F., Canaan, O.
Prusham, J. P., London, Ont.
Purvis, T., Mallorytown, Ont.
Reycraft, R., E. Murkirk, Ont.
Richards, W. H., Greenville, O.
Richards, H. S., Wooster, O.
Rodgers, J. C., Ayr, Ont.
Rudd, S. C., Guelph, Ont.
Rutherford, J. D., Lucknow, Ont.
Shields, A. W., Malton, Ont.
Sinclair, J. A., Uxbridge, Ont.
Sloan, J. M., Vicksomburgh, Pa.
Steen, J., Harwich, Ont.
Snider, S. S., Lawrenceville, O.
Snyder, O. W., Lynville, Pa.
Sullivan, J., Almont, Ont.
Summerfeldt, G. H., Toronto.
Sutterby, F., Batavia, N. Y.
Taylor, J. Q., Marysville, O.
Tye, F. M., Haysville, Ont.
Vsitch, J. H., Waterloo, Ont.
Waldron, R. M., Greensburg, Pa.
Wallace, W. B., Middletown, O.
Ward, H. H., Rochester, Ind.
Waring, J., Thornbury, Ont.
Waters, J. W., Fingal, Ont.
Weese, W. F., Plattsville, Ill.
Welsh, J., Manchester, Ont.
Wilkinson, F. C., Claremont, N. H.
Winner, C. E., Muncy, Pa.
Wiltrout, F. A., Litzenburg, Pa.
Watson, T. W., Marshalltown, Iowa.
Walton, T. W. Warren, Ill.
Young, W. C., Bristol Corners, P. Q.

MEDALISTS AND PRIZE WINNERS.

The gold medal for the best general examination, presented by the Ontario Veterinary Medical Association, was awarded to John E. Blackwell, of London, Ont.

Pathology—Seniors: Silver medal, J. C. Booker; 2d prize, R. M. Waldron; 3d, J. E. Blackwell and C. E. Winner. Juniors: 1st, R. L. Jameson; 2d, C. D. Morris; 3d, W. H. Lindsay, J. D. McGregor, W. T. Russell and W. H. Allis (equal.)

Anatomy—Seniors: Silver medal, J. E. Blackwell; 2d, R. M. Waldron; 3d, H. Fell. Juniors: Silver medal, W. E. Russell; 2d, W. Burger; 3d, E. D. McQueen and S. J. Robinson (equal.)

Physiology—Seniors: Silver medal, J. Rutherford; 2d, J. E. Blackwell; 3d, H. Fell. Juniors: 1st, J. J. Coutts; 2d, A. G. Wicks.

Chemistry—Seniors: 1st, J. Moore; 2d, T. D. Hinebauch; 3d, J. G. Harris. Juniors: T. H. Smythe.

Materia Medica—Seniors: 1st, J. E. Blackwell; 2d, E. Coffin; 3d, J. J. Kline and R. M. Waldron (equal.)

Microscopy—Seniors: 1st prize, C. E. Winner, H. Fry, J. Rutherford (equal).

Bacteriology—Seniors: 1st, B. Johnstone and C. E. Winner (equal.)

Entozoa—Seniors: 1st, F. N. Lijer.

LIST OF GRADUATES.*

HARVARD UNIVERSITY—VETERINARY DEPARTMENT.

Edward Campbell Beckett.....50 Village St., Boston.
Alfred Mahlon Bigelow.....Cor. Washington and Cottage Sts., Norwood.
Charles Saunders Breed.....441 Tremont St., Boston.
Daniel David Lee.....Storey Place, Jamaica Plain.
William Esrom Peterson.....Cor. Main and Church Sts., Waltham.
Herbert Massey Smith.....30 Essex St., Haverhill.
William Herbert Way.....22 Elm St., Chelsea.
Kenelm Winslow.....Perkins St., Jamaica Plain.

* From the Fifth Annual Announcement, 1887-'88.

CORRESPONDENCE.

ON HOG CHOLERA ETIOLOGY.

LINCOLN, NEB., March 28, 1887.

Editor American Veterinary Review:

I see by your March number that Dr. Salmon still insists that there are "two distinct swine plagues" in this country. Now I will not say there are not, but I will say, and leave it to the future to decide the correctness of my assertion, that no one has

yet described "two distinct swine plagues" in this country. Unfortunately, you do not give the date of Dr. Salmon's communication, so I cannot tell whether it was written before or after my individual communication upon the "Etiological Moment in American Swine Plagues," which was issued December last, and of which a copy was sent to Dr. Salmon. In that paper my position was positively stated and I still adhere to it. I there endeavored to show why so many ideas had been promulgated about this disease where authors had endeavored to characterize it by its pathological lesions. And I also endeavored to show that no one of these lesions, except those of the lymph gland, could be called pathognomonic. It is no wonder that Dr. Salmon is trying to explain his unexplainable inconsistencies, and, as far as I can judge from his descriptions, I still claim that the Nebraska disease is identical with that described by him in 1885, and that there is some mistake about his description of the germ.

As you know my paper on the "Etiological Moment in Swine Plague," will you please publish it in justice to me, as well as to show my real position towards the paper on Hueppe's communication published in your issue of March, 1887. If Dr. Salmon's letter to you was written subsequent to my publication of December last, he simply shows his intellectual dishonesty and inconsistent character when he says I have "not yet told us whether the germ is motile or non-motile," as in that paper I distinctly said *it was*, "all authorities to the contrary." The latter remark was directed at Schuetz of Berlin, as, if his germ is "non-motile" in fluid culture, it is the only essential point of biological differentiation between our micro-organisms. I am sincerely obliged to Dr. Salmon for calling my attention to the mistake made by Dr. Bowhill with regard to "ech. gigas," calling it "ascaris suilla." I did not give the parasite (as such) even a moment's thought at the time, nor have I since, my whole attention being called to the great similarity of the lesions it caused in the small intestine to those often seen in swine plague in the large, *but not necessary to it.* Dr. Bowhill took down Cobbold and wrote the description from him. I did not even look at it or the worm, being very busy on other matters. I make

no other apologies. It was simply want of thought from too much pressure from other work. To-day I examined the object and see it has a pointed tail and a horned proboscis, so I stand corrected. I am not hunting worms at present. The time will surely come when either Salmon or I will have to take a back seat on this swine plague question, but while I admit there may be another disease with a different micro-organism than that yet seen by me, *I must positively assert that no one has described it yet, and that my views as published by myself have not been contradicted successfully by anyone.* I have had no two germs so far, and I do find intestinal lesions in many hogs, that die or are personally killed, before death. I do not consider them essential to swine plague, but an accidental complication, as is also the pneumonia, which is more frequent than the intestinal lesions. Detmers found the same conditions and came to the same conclusions.

In time this question will be settled, and the world will know who is right, honest, and consistent between Dr. Salmon and myself. Most respectfully yours,

FRANK S. BILLINGS.

VETERINARIAN WANTED.

HACKETTSTWON, N. J., March 18th, 1887.

DEAR SIR:—This town and vicinity is greatly in need of a regular veterinary surgeon.

The present Legislature has just passed (15th inst.) a bill requiring veterinary surgeons to be graduates of a regular college. Penalty for violating said act is $25.00 fine or six months imprisonment. Exemption is granted to persons with ten years' experience of the veterinary practice and who have *practiced that length of time in the same locality.* There is not a regular veterinary surgeon within twenty miles. This is a splendid country, and to an alive man, and one who has *had practice* and not too young, a good practice is guaranteed. There is no opposition; that is, can't be with the present law, by those who have been practicing here.

Population of Hackettstown, 3,000.

Will answer any questions cheerfully.

Yours very truly, WM. F. SHIELDS.

ON GLANDERS.

DAYTON, OHIO, April 11, 1887.

Editor American Veterinary Review :

DEAR SIR.—In an article on "Glanders," which appeared in your April number, reference is made to Professor Williams and Dr. Fleming's theory on the origin and generation of *glanders*, in which the writer says the above gentlemen "speak of glanders as a special diathesis peculiar to the equine species." Now if the writer kept himself posted in regards to the above gentlemen's opinion on this subject, he would know that both Professor Williams and Dr. Fleming have long since changed their opinion as to the origin and generation of *glanders*. They both claim "*glanders*" is due to contagion only, and this contagion is in the form of a special micro-organism, and an animal can only contract the disease by inoculation either by an abrasion of the skin or wound of the mucous membrane.

Yours respectfully, WALTER SHAW, V.S.

ON VETERINARY REGISTRATION.

Editor of American Veterinary Review :

SIR:—The accompanying communication seems to me to be a very good illustration of the qualifications of the best samples of those who would take advantage of the registration laws as existing, and would parade themselves as registered veterinarians, etc., men of some standing, as it were, in many communities, but to my mind the parasites that destroy the legitimate growth of our profession, and which show that sometimes a little knowledge is worse than none at all. W. H. L.

DEAR DOCTOR:—I found this morning a diseased cow which I had destroyed, fearing she would create disease among the other cattle. When I came to kill her I found the lungs, or a portion of them, filled with tuberculosis buds just ready to mature and set the fire agoing. This cow had not been kept with the other cattle, but I think it prudent to have the other three inoculated. Will you be kind enough to send me or instruct me where I can obtain virus to inoculate them with, and oblige,

Yours truly, G. W. M.

AMERICAN VETERINARY REVIEW,

JUNE, 1887.

EDITORIAL.

LEGISLATION RELATING TO VETERINARY MEDICINE.—Although ignored years ago, veterinary interests are now receiving a large share of attention—Pennsylvania asked to appropriate $100,000 for the veterinary department of the university of that State and gives $50,000—a law to regulate the practice of veterinary medicine asked for in Pennsylvania and New Jersey—the latter State fails to get it because she refuses to recognize quackery—New York gets one useless law, while a good one is refused—any one in that State can register—the good law is killed by a grinding diploma fee—a good lobby investment—lack of respect for the profession, and want of honor in word-keeping—the American Veterinary College gets the benefit of one more special act. CERTIFICATES OF SOUNDNESS.—Inquiry by a purchaser—the examination for soundness is one of the most responsible and important incidents of veterinary practice—is a trust demanding the most careful attention by the practitioner—the fee is not in proportion to the value of the work if it is properly done—buyers ought always to employ responsible parties and trust to their ability and mode of examination, which should be done with scrupulous care, especially when done under conditions varying from the common, and wilful or ignorant misrepresentation deserves severe punishment by the courts. CORRECTION.—The membership of the Missouri State Veterinary Society is confined exclusively to regular members of the profession—letter of Dr. Paquin to that effect. NOTICE.—The May number of the REVIEW has failed to reach many of our readers—suggestion for future issues. EXPERIMENT STATION OF NEBRASKA UNIVERSITY.—Reappointment of Dr. Billings—the university will not, for the presant, establish a veterinary department—Dr. B. does good work, and deserves well for his labors in behalf of the profession.

LEGISLATION RELATING TO VETERINARY MEDICINE—Twenty-five years ago who would have dreamed that veterinary science would ever acquire such an amount of importance in the estimation of the public as to become the subject of legislation in a number of the States of the Union, that these law-makers should

be asked to consider the merits of various enactments relating to that branch of medicine, declarative of its rights and protective of its interests? Yet to-day we have the record that not in one State alone but in many of them this is among the matters importunately urged for legislative action and popular attention.

In Pennsylvania, notably, a proposition has been introduced for an appropriation of $100,000 in behalf of the Veterinary Department of the University of that State in Philadelphia, the expenditure having for its object the completion of the buildings and other equipments of that department. We had always thought that the University of Pennsylvania possessed sufficient wealth to sustain the work of its special department without recourse to the State Association. We had also supposed that the generous private donations she has already received, and which have already accomplished much good, would have removed the necessity of further subsidies in the prosecution of the work which has been inaugurated. The members of the faculty having thus far furnished their services gratuitously, is it now to be inferred that a share of these $100,000 is calculated upon to aid in securing a continuance of their labors? We know of other institutions in the country where the members of the faculty have been for years, and up to a recent date, doing the same work just as generously. We sincerely hope, however needed, that the dollars will be brought to the rescue of the veterinary department in question, which is, no doubt, destined to become one of the first of the country in importance and usefulness. As we go to press, we receive the information that our hopes have been partly realized, and that the Legislature has granted $50,000, instead of the $100,000 asked for. A pretty nice help, however, and Pennsylvania can be proud of the wisdom of her legislators. Other bills involving veterinary interests have been introduced in the Pennsylvania Legislature as well as in that of New Jersey, but in neither State have their friends succeeded in having them passed into laws. The failure of the attempt in New Jersey, as we are informed, is to be attributed to the refusal of the veterinarians who were urging it, to submit to concessions which would legalize the practice of unqualified men. A good credit-mark should

be awarded to our Jersey confreres for this. But the most interesting spectacle of all has been the course of things in the Legislature of New York. If we have not been misinformed, the Solons of the Excelsior State have had no less than seven bills simultaneously offered for their consideration, of which, however, two only are of any interest to the profession of the State. One of these was passed and received the signature of the Governor; the other was killed. The first authorizes the extension of the rules of registration. It was a law which, however, was after all of but little account, when we take into consideration the wording of the act of last year, and the fact that now every man who wishes to do so may register. Yes, Dr. Middleton, we can answer your inquiry. We believe that any of your neighboring blacksmiths who so elect may go on filing horses' teeth, and may collect his two dollars without any fear of the penalty of the law. And if you ask us who is responsible for a state of things so absurdly disgraceful, we answer: Those who killed the second bill; those who, after petitioning the Legislature for the reinsertion of the clause eliminated from last year's law, prevented the transmission of the memorial to Albany, and thus caused the movement to abort; those, both regular and irregular, who are running a mill for grinding out diplomas and certificates, and own a veterinarian factory which returns them fat fees without work; those who, recreant to their word and to all considerations of professional honor, are perpetuating a system of disgraceful jobbing which will retard the progress of the profession in the State, and keep it half a century behind the age.

How long must this evil continue? is a pertinent query for the veterinarians of New York to answer. It is for them to say whether, as members of the profession, for which they have so laboriously toiled, they will allow themselves to be thrust aside, or walked over and ignored, in order that diploma-mills and certificate-machines may grind on and flourish undisturbed in their midst.

The legislators at Albany, it may further be said of them, though they have not only passed a useless law, and have refused to pass a valuable one, have still, once again, proved their appre-

ciation of the work done by the American Veterinary College by authorizing the acquisition of property to the amount of $150,000 by that school. Perhaps it ought to be considered that it is doing pretty well to obtain in two years two *special legislative acts* for an institution which, it is said *by some of its friends* (*?*) has no right to grant diplomas.

Correction.—An error seems to have occurred in one of our recent issues, in our remarks touching the amendment to the Constitution of the United States Veterinary Medical Association, offered by Professor Michener, in which we stated that the Massachusetts Veterinary Medical Association was the only one in the country which restricted its membership to regular graduates. Dr. Paquin writes a letter requesting a correction of this statement, from which we learn that the Missouri Veterinary Medical Association has always respected this wholesome rule, and is wholly made up of genuine graduates. His letter will be found on another page.

Notice.—We have received this month a very large number of communications complaining of the non-receipt of our May number by our subscribers. We are at a loss for an explanation of this default, as the May Review has been regularly mailed to every one who had notified us to renew his subscription. And in relation to this matter, we will say that the Review is *always* mailed between the second and the fifth of each month. If not received in due season after the period designated, inquiry ought to be made at once at our office, or of the mail authorities.

CERTIFICATES OF SOUNDNESS.

To the Editor of the Herald :

A man buys a horse on the faith of a veterinary surgeon's certificate that the horse is sound. The buyer soon discovers that the horse is not sound and was not at the time of purchase, and that he (the buyer) is the victim of either ignorance or wilful misrepresentation on the part of the veterinary whom he has employed. Does the law afford any recourse against a veterinary under these circumstances? Ignorant.

The above inquiry was addressed to the *Herald* a short time ago and received a proper answer from the editors of that valuable paper. Of all the specialties which belong to the practice of the veterinarian there are probably none which is more important to

the public, or which so thoroughly tests the resources of the practitioner as his implication in a horse-trade. The satisfactory examination of an animal for soundness at the time of purchase involves a question of trust which every veterinarian must fully appreciate, and in which he is bound to exercise the most scrupulous care, and every respectable practitioner will do his utmost to insure justice to the parties trusting his judgment. The duty, however, is sometimes a very difficult one, and in many instances involves special conditions, which renders the giving of an opinion a very onerous and perplexing task, and no amount of caution, and no degree of circumspection and discrimination will be wasted in the study, by the veterinarian, of all the elements of the case before him. The fee which is received for the work done and the responsibility attached to it, is not, however, usually proportionate to the expectations entertained by the buyer. Again, there are in many cases so many difficulties involved in the solution of the general question as to what really constitutes soundness, that there is really always more or less room for the intrusion of legal quibbles and quiddities. A horse-trade is notoriously and proverbially, amongst all the transactions in which men are accustomed to engage, that which most severely tries the conscientious aptitude of a man in connection with the average of men's general intelligence.

We do not wish to speak in extenuation of anything like a manifest evidence of ignorance or of dishonesty. We know too well that there are daily examples of such occurrences. What we especially desire to say in the matter is, to advise buyers to confide their interests to none but qualified and reputable practitioners, and to trust to *their* ability and their methods of examination, independently of any suggestion or objection that may be made by the interested dealer, whoever he may be. Let the veterinarian perform his duty in the very strictest sense of the word; let him examine the animal in every possible condition, placing him in such circumstances as shall not only exhibit his alleged present soundness, but shall betray his unsound condition, if it exists; let him test the animal, as nearly as he can, as the examining physician of a life insurance company tests a candidate for a life

policy, and let him, without hesitation or fear, put down in black and white, in the shape of a certificate, a proper statement of his conclusions, and he need not then fear prosecution for ignorance or wilful misrepresentation, which, if they existed, would most deservedly bring upon him a severe retributive visitation in the courts, such as we are sure he would indeed mercilessly receive at the hands of his brother practitioners in case they were made his judges.

Experiment Station of the University of Nebraska.—As is well known to the majority of the readers of the Review, our colleague, Dr. Billings, was called to take charge of this work in April, 1886, the call being of a temporary character. At the business meeting of the Regents of the University, April 1, 1887, Dr. Billings' appointment was made permanent at the usual salary paid professors; but, what is of more interest, the sum of four thousand dollars additional was voted for carrying on the work.

It is to be noted, to the credit of the regents of this western university, that they have not fallen into the error made by some other institutions, of attempting to do something with nothing, and inaugurating a veterinary department with but one professor to do the work requiring quite a number of specialists. We can see the influence of our colleague in this, who has ever determined that he would never be contented with any thing or institution which attempted to do a thing directly opposed to the live-stock interests of the country and those of the veterinary profession. The gratitude of the whole country, particularly the West, is due the Board of Regents of the Nebraska University for taking this stand upon a matter of such vital importance. They have the honor of establishing the first experiment station for the study of animal diseases in connection with medicine, or even where the sole work is research and where teaching is not made a necessity, of any American university, and thus have been the first to lead to the establishment of the principle which marked the successful advancement of preventive medicine in Europe. The veterinary profession of America may well congratulate itself that this important work has been done through the in-

fluence of one of its members, and that through him a path lies open which the human school can only follow in, but never initiate. Thus veterinary medicine is beginning to assume its proper place in the country. As a last word, we can only say that we earnestly hope that the regents of this university, who have seen fit to retain our colleague, will find no reason of becoming dissatisfied with the course they have pursued, and beg to assure them that every earnest member of our profession is with them in their desire to establish veterinary medicine upon the only true foundation—the scientific.

ORIGINAL ARTICLES.

GLANDERS.

By Veterinarius.

A Contribution for the Prize offered by the U. S. Veterinary Medical Association for Papers published in the American Veterinary Review.

(*Continued from page* 83.)

The Inoculation of Guinea-Pigs with Glanders Bacilli.

Dr. Loeffler experimented with eighty-five animals. The virus was introduced into the side of the abdomen by cutting through the skin with a pair of sterilized scissors and making a pocket with a steel needle. Each animal was placed in a separate box and they were then put in an isolated room. *Not a single one of the inoculated guinea-pigs remained exempt from infection.* The course of the inoculated disease varied in the different animals. At the locus inoculationis little was to be seen during the first two or three days. The edges of the wound were either adherent or covered with a thin eschar and slightly swollen. About the fifth day the locus inoculationis became tumefied; the edges of the wound hyperæmic; separated and secreting a purulent fluid eventually leading to the formation of yellow scabs. Finally an extensive ulcer developed with swollen edges and a purulent lardaceous base. The glands corresponding to the parts involved be-

came tumefied towards the end of the first week. The characteristic cord-like enlargement of the lymphatics, so common in horses, could not be felt. The glands, at first as large as a pea, soon became larger and their parenchyma underwent a purulent degeneration which eventually broke out externally. When this took place at an early stage the characteristic bacilli were easily demonstrated. The later this happened the fewer bacilli were present. In some of the animals no further external phenomena took place. In course of time the ulcerations healed and the animals again gained in condition. The induced disease assumed quite another course in the majority of the animals. The second week after inoculation a peculiar complication of the testes was noticed, consisting of small noduli in the testes and epididymis; the scrotum also became diseased; the folds of the tunica vaginalis became inflamed and adherent to one another and the skin, so that the skin could not be moved. The external skin became red and odæmatous; finally rupture of the noduli occurred, and on pressure a puriform material escaped in which numerous bacilli were found. In the females an intense tumefication and ulceration of the mamæ and labiæ developed. These affections are, however, under similar conditions, less frequent than orchitis in the male. Towards the end of the second week an eruption in the feet occurred, which were swollen, red, hot, and very sensitive on pressure. These conditions frequently disappeared in one foot and appeared in another; sometimes all four feet were affected; these complications frequently ruptured and gradually healed. Besides these very characteristic phenomena of glanders in guinea-pigs, local complications of superficial muscles were observed in other parts of the body, such as the face, where they developed from the periosteum and even complicated the osseous tissue, and sometimes caused penetrating ulcers in the nasal bones. The nasal mucosa was found diseased in about one-third of the cases, indicated by disturbances in the respiratory phenomena, but profuse nasal secretion was seldom observed; crusts on the alae nasi were frequent in such cases. When the affection of the nasal muscosa occurred it was generally the concluding act of the drama.

The animals generally perished in the third or fourth week,

sometimes the first or second, and occasionally extending to the seventh or eighth. The autopsy of such animals gave the following conditions: Inguinal and axillary glands tumefied, moist and lustrous; on section numerous centres containing a purulent material were seen; the whole gland underwent such degeneration and became enclosed in a capsule of indurated tissue. Abscesses of various sizes were found in the skin, many of which showed a tendency to heal. Some of the pedal joints were swollen, caused by the development of peri-articular abscesses and which extended into the tissues between the digits and often complicated the bones. The lungs contained many nodular neoplasms of various dimensions, many of which were surrounded by hyperæmic tissue; these noduli became more apparent after hardening in alcohol. No changes were observed in the heart. The spleen was affected in nearly every case and contained numerous greyish-white noduli, as also did the liver, but not nearly so many as the spleen. The kidneys were free from all neoplasmata and bacilli, and on cross section they were normal or slightly clouded in appearance. On the other hand the bacilli were found in the urine, their true character being determined by inoculation experiments. A few isolated noduli were occasionally found in the suprarenal capsules. Noduli, many of which had undergone puriform degeneration, were found in the omentum, the suspensory ligament of the liver and the retroperitoneal tissues. The intestinal tract was normal. When the processes on the testicle were of recent date they consisted of submiliary noduli situated in hyperæmic tissue; when older they contained large caseous centres, frequenty undergoing puriform degeneration or bursting externally. The ovaries of the female were not diseased in the same manner, but isolated yellow neoplasms were sometimes found. The mammæ frequently presented similar conditions. The nasal mucosa was red, swollen, and interspersed with numerous small lenticular ulcerations, frequently extending to or penetrating the underlying osseous tissue. The bacilli were easily demonstrated in all the products when fresh, in later stages with difficulty, as many of them undoubtedly perish when disintegrating processes commence. Fresh pulmonary noduli are especially useful for bacillus examination on

account of the great numbers generally present, and can be used for both covering glass preparations and study of the bacilli in situ in the tissues.

Experimental Diagnosis.

Dr. Billings found the kidneys in a case of chronic glanders in the horse free from nodular products, though interstitial nephritis was very marked, but cultivations from this kidney in blood serum showed the presence of bacilli that developed yellow vesicles, as described by Dr. Loeffler.

Dr. Loeffler found the bacilli in urine. I think this test should be used in regard to diagnosis of chronic cases of glanders in the horse. It has been shown that guinea-pigs are favorable for the study of experimental glanders, especially bacterial experiments, but are of considerable disadvantage in test cases for suspected glanders in horses, owing to the average duration of the disease being twenty-six days, and the characteristic phenomena are sometimes rendered uncertain by the appearance of an inhalatious tuberculosis; however, it is not difficult to diagnose between this and glanders in the guinea-pig.

The affections of the testicles, joints and nose, in glanders, and the peculiar colonizing of tubercle bacilli, are sufficient means of differentiation regardless of the macro-pathological difference in the appearance of the tubercle in glanders and tuberculosis. In such cases the various forms of pseudo-tuberculosis must also receive attention.

It was necessary to find some animal, if possible, that would reach against the inficiens of glanders in such a manner as to place the diagnosis beyond all question or doubt.

Numerous experiments were made with white mice, rats, birds, etc., but they were unsatisfactory, compared with those with the common field mouse *Arvicola Arvalis.* They must be kept separate, for if one dies the others immediately proceed to eat it. This animal seems to exceed all others in its susceptibility to glanders infection. Dr. Loeffler inoculated fifty with many different cultures of glanders bacilli and they died as follows:

4	in	2	days	after inoculation.
23	"	3	"	"
9	"	4	"	"
8	"	5	"	"
4	"	6	"	"
1	"	7	"	"
1	"	11	"	"

The average duration of the disease being between three and four days. The course of the disease was almost always the same. The animals appeared perfectly well on the first and frequently the second day after inoculation, ate well, ran about and buried themselves in the saw-dust of their cages. They then became less lively, withdrew from observation or sat in one place, with rough-looking coats and adherent eyelids, rapid respiration and no appetite; they were then observed to fall on one side and die without any convulsions. The microscopical results were exceedingly characteristic but different from those observed in glanders in other animals. The locus inoculationis was infiltrated with a greenish-gray appearing mass, penetrating the superficial layers of contiguous muscles, and from this point lymphatic cords could be traced to their appropriate lymph glands, which were hypertrophied and more or less filled with greyish-white centres. Spleen enlarged and its parenchyma studded with yellowish-white noduli, frequently surrounded by a red anulus of distended vessels, and superficial neoplasmata were often seen above the surface of the capsule. The liver contained numerous small noduli, but they did not extend above the surface of the organ. The kidneys did not appear to have undergone any changes. The suprarenal capsules and ovaries were frequently the seat of small ecchymoses, with occasional yellowish-white nodules dispersed throughout their substance or upon their surface. Joint affections were observed in five cases, the most common seat being the pedal joint. They were swollen hyperæmic, and when cut a puriform fluid escaped. In one case all four joints were affected. Affections of the skin, besides those already mentioned at the locus inoculationis, were not observed. The nasal cavity was free from complications. Glanders bacilli were found in great numbers in the spleen, lungs,

and liver. The noduli had exactly the same microscopical appearance as the lymphomatoid neoplasmata described by *Virchow* and *Klebs* in ileotyphus. Bacilli were present in the centre of these objects in great numbers, frequently in the body of lymphoid cells, and in the cut section of blood vessels between the red blood cells. Cultures upon blood serum gave the characteristic yellow vesicles. It will thus be seen that the field mouse affords all the conditions that are necessary to test the infectious elements in glanders, and is especially valuable for inoculation in doubtful cases in the horse. This mouse is not affected by the bacteria of *mouse septicæmia* in contradistinction to the white mouse, while the latter is nonsusceptible to the action of *glanders bacilli.*

The Biological Peculiarities of the Bacilli in Different Cultivating Media.

As already mentioned glanders bacilli develop exceedingly well upon the stiffened blood serum from horses or sheep.

On the third day after being sown the bacilli appear upon the surface of the serum in transparent yellow vesicular colonies. On penetrating one of these drops gently with a platinum needle, and withdrawing same gently it will be seen to be connected with the colony by a very delicate thread of its substance, which shows that it possesses a tough mucoid, viscid character. The appearance of such a colony changes after it has been from eight to ten days in the *thermostat.* They lose their yellow transparency and become milk-white; this is especially marked when the cultivations were made upon greenish colored equine blood serum. A microscopic examination of these colonies revealed the presence of numerous rod-like organisms possessing a high degree of refraction, which at first gave the impression of large free spores, but proved to be quite otherwise, from their angular form and irregular size; they are undoubtedly small crystals, the precipitation of which causes the whitish change of color in the vesicles; the nature of these crystals was not determined.

The bacilli also develop in a similar but not so luxuriant manner in the stiffened blood serum of cattle. They also develop well in infusions made from the flesh of man, horses, sheep,

rabbits, dogs, cattle and fowls, with and without the addition of one per cent. peptone. At the termination of the second or third day the solution becomes clouded, and a mucoid precipitation appeared in the bottom of the vessels.

It was of great interest to decide if these bacilla would develop upon cultivating media of a vegetable nature, especially as cooked potatoes were an exceedingly suitable medium for such cultivations of *anthrax bacilla*. The result was most satisfactory. On the second day the surface of the cut potato was covered with a delicate yellowish transparent coating; on the third day all the potatoes were covered with a beautiful amber colored mass, consisting entirely of bacilla; from the sixth to the eighth day this color assumed a reddish shade, the transparency being lost; that part of the surface of the potato not occupied by the culture was of a delicate green color, while that of noninoculated potatoes remained greyish-white. Repeated cultivations demonstrated the constancy of these phenomena. Other bacteria also form yellow drops upon blood serum, so that microscopic differentration between them is a matter of difficulty. Dr. Loeffler says that the above appearances upon potatoes form a characteristic peculiar to the bacillus of glanders. A certain resemblance to this bacillus is also seen in cultivations of that of blue-green pus, but by *spreading a small quantity of the latter upon white filtering paper and subjecting it to the fumes of strong ammonia, you at once get the characteristic bluish-green color*; whitish-brown extension along the line of the inoculation puncture. To arrive at the most trustworthy results regarding the influence of temperature on the vitality and growth of the glanders bacilli, the following method of experiment was adopted. A small quantity of freshly distilled water was poured into a glass vessel used for the bacterial examination of air and a freshly sown potato was introduced upon the crystalization apparatus, and by the side of the potato a trustworthy thermometer was placed; the mouth was then closed with cotton, and over this a piece of thin sheet rubber was drawn to prevent the too rapid evaporation of the moisture. The apparatus was then placed in a d'Arsonoval thermostat fixed at a certain temperature. At 20° C. the bacilli did not, *which is not the case*

if you treat cultures of the glanders bacilli in a like manner. The microscopic examination of *pus-bacilli* shows them to be larger than those of glanders, and exquisitely motile. The observations of Kitt and Weichselbaum confirmed those of Dr. Loeffler, without their having any previous knowledge of his experiments. These experiments were proved upon guinea-pigs and field mice with the most satisfactory results. Dr. Loeffler kept one cultivation upon a potato medium from the 1st of April, 1883, to the beginning of July, 1884; it was found to have lost much of its virulence by experimental inoculation, as great quantities only caused slight local reaction in guinea-pigs. By means of these media the limits of temperature under which these bacilli thrive was determined.

In a meat-water peptone solution, with or without agar-agar, a morbid development of these bacilli could be distinguished at the ordinary temperature. The cultures in flesh-water peptone gelatine remained sterile under the same circumstances—that is, at a temperature of 15° to 20° C. At over 20° C., and at a degree which did not cause the gelatine to become fluid, but still affected its consistency, the bacilli developed in the shape of a proliferate; at 22° C. a spur of development was observed; at 25° C. the potato had a delicate yellow coating; at the end of five days, while at 37° C., a profuse development occurred within three days; at 27° C. the growth was not nearly so luxuriant; between 30° and 40° C. they seem to proliferate with a like rapidity and profusion; 41.5° C. somewhat checked the development; the color was already of an amber shade, and the individual colonies remained very small. The microscopic examination showed the bacilli to be very short, and to have a stunted appearance. At 43° C. they remained about the same, while all proliferation ceased when the temperature was raised to 45° C. The lowest temperature limit in which glanders bacilli retain their biological activity is a matter of the greatest importance. A temperature of 25° C. is no unfrequent occurrence for many days at a time during the summer months. It is possible that the fluids within such stables may provide suitable media for these bacteria to retain their vitality outside of the animal organism. It is well

known that in hot climates this equine malady acquires an extreme degree of extension, in contradistinction from Northern climates. According to Krabbe, there occurred in 10,000 horses in Norway, from 1857 to 1873, 6 cases of glanders yearly; in Denmark, 8.5; in Great Britain, 14; Sweden, 57; Wurtemburg, 77; Prussia, 78; Servia, 75; Belgium, 138; in the French army, 1,130; in the Algerian army, 1,548; which shows that glanders increases in frequency as we go from a northern to a southern climate.

Krabbe and Bollinger are, however, of opinion that this variation is due to the manner in which veterinary police laws are executed; but there is abundance of evidence to show that the climate must not be left out of consideration. This question caused Dr. Loeffler to endeavor to see if the bacillus of glanders would develop in the fluids of horse stables, and if they were able to continue an ectogenous existence.

All experiments in this direction gave a negative result, while the experiments upon potatoes were equally positive; hence an extra organismal development under such circumstances is not very probable. It was of importance to know whether the bacilli of glanders developed spores or not. The majority of observers have answered this question in the affirmative, but their assertions were based upon studies of microscopic specimens of the colored bacilli. Weichselbaum saw some granules which gave the appearance of the spores being inside the rods, and positively pronounced these objects to be spores. *Dr. Loeffler was unable to discover any spores after the most exact and detailed observation of the bacilli*, and he considers the polar coloring a phenomena of death of the middle portion of the rod, which had lost its affinity for coloring material, as has been observed with other bacteria.

This assumption is strengthened by the fact that very old bacilli loose their affinity for coloring material throughout their entire length. A question of such importance cannot be decided by microscopic examination alone.

METHOD OF COLORING THE BACILLI OF GLANDERS.

Covering-glass preparations from glanders material can be

made with aqueous solutions of the different aniline colors—methyl-blue, gentian-violet, and fuchsin—but the result is more satisfactory with other preparations, such as alkaline coloring solutions, prepared by taking three cubic centimetres of a solution of caustic potash, 1 to 10,000 parts of aqua, and adding to it a concentrated alcoholic solution of either of the above colors. Solutions of aniline water, gentian-violet or fuchsin, as used for tubercle bacilli, give very fine effects when mixed with the same quantity of the above mentioned potash salt, or a one-half per cent. solution of liq. ammon. fort. The addition of the alkali to all coloring solutions is very valuable in the study of bacteria; the coloring takes place more rapidly and intensely, and other organisms, such as the actinomyces fungi, which color imperfectly by the Gramm method, color beautifully with the addition of caustic potash.

The mixture must be made fresh each time, as the potash forms a precipitate in a short time with gentian-violet or fuchsin. Both the alkali and coloring material ought to be filtered before use. Float the covering-glass specimens in the solutions for five minutes, take out and dip for a second or two in 1 p. c. acetic acid solution, to which add sufficient trapacolin, O. O.; then wash specimens quickly in distilled water. The addition of trapacolin has the effect of removing the color entirely from the plasma of the cells, and somewhat from their nuclei, while the bacilli retain their color perfectly. This gives the preparations a peculiarly clear appearance.

By treating similar preparations with concentrated aqueous or aniline water solutions according to the ordinary methods of coloring bacilli, it is impossible to find those of glanders by subjecting them to the action of a fuchsin solution for twenty-four hours; a few may be discovered. The result is quite different when an alkaline solution is used. For instance, when an alkaline solution of methylen-blue is used, a section or covering-glass specimen has only to remain a few minutes in the mixture to color; then proceed as above with the combined solution of acetic acid and trapacolin, alcohol, and cedar oil; then mount in Canada balsam. When an alcoholic solution of gentian-violet or

fuchsin is used, the section must remain in it from fifteen minutes to half an hour. A solution consisting of 10 c-cms. of aqua distilli., to which has been added two drops of concentrated sulphuric acid and a few drops of five per cent. oxalic acid solution for the treatment of sections colored in methyl-blue, is much better than acetic acid trapacolin. This solution removes the color from the tissues and nuclei without having any effect on the bacilli. The duration of the action of this decolorizing agent cannot be exactly given, being a matter of practical experience, depending on the thickness of the sections of the tissues. Thin sections of pulmonary tissues should remain in the alkaline methylen-blue solution for two to five minutes, and then wash for five minutes in the oxalic acid mixture, then with absolute alcohol, cedar oil, and mount. It is an advantage to place the sections in a solution of caustic potash, 1 to 10,000 of aqua, for a few minutes before immersion in the coloring fluid. If the coloring has been successful, the bacilli will be very easily defined by their dark blue border. I found it better when using methylen-blue and an alkali, to allow the sections to remain in the coloring fluid for at least twenty-four hours; then transfer to the oxalic acid mixture, then into 60 per cent. alcohol, and then into a contrast stain eosin; from there into 90 per cent. alcohol, then into absolute alcohol and oil of cedar, and mount in Canada balsam. This method I found by far the most satisfactory. In old noduli the colonizing test is not to be depended on, the cultivation method being the most reliable. Glanders bacilli are thoroughly decolored by treating them with permanganate of potash in the same manner as Lustgarten claims peculiar to syphilis. By treating a fresh glanders nodule, according to Lustgarten's method, with permanganate of potash and submitting the same to microscopic examination, you will find a circumscribed cellular phenomena, in which the limits of the alveoli are filled with cells which are of an epitheloid character, as well as small round cells which also fill the interstitial framework. The capillaries surrounding the nodulus will be found distended with blood-cells, with an occasional diapedesis. In the center of the nodule bacilli can be seen collected in small groups, and closer examination demonstrates the presence of an

enclosing membrane, showing that they occupy the body of a cell in which the nucleus has perished. In old noduli the alveolar structure cannot be defined ; the center is occupied by a mass of detritus, parts of which stain a dense blue color. The detritus is not so dense towards the peripheries, and a few bacilli may now and then be seen, and sometimes a group within a cell. The bacilli cannot be seen in cross sections of blood vessels, or in covering-glass specimens of blood from the heart. Only in most acute cases have the bacilli been demonstrated in the blood, although they are undoubtedly present in acute stages of the disease, when noduli break through into the blood vessels. This is also the case in tuberculosis, as shown by Weigert and Koch. The more acute the course of glanders, the quicker the phenomena of generalization appears; the more probable will be the discovery of bacilli in the blood. This fact corresponds with the result of inoculation or transfusion experiments with the blood of glandered horses, which proved negative in the greater number of cases.

(*To be continued.*)

VETERINARY JURISPRUDENCE.

FORENSIC MEDICINE.

By D. P. YONKERMAN, Cleveland, O.

(*Continued from page* 34.)

As to medical secrets: The highest legal authorities in England have decided that medical men enjoy no special privileges with regard to secrets of a professional nature. In other words, no practitioner can claim exemption from answering a question because the answer may or would involve a violation of secrecy or even implicate the character of his patient.

But the courts of New York, with more respect for the honor and knowledge of the conditions under which the medical man becomes the possessor of secrets involving the character of whole families, have wisely passed the following law:

" That no person duly authorized to practice physic or sur-

gery shall be allowed or compelled to disclose any information which he may have acquired in attending any patient in his professional character and which information was necessary to enable him to prescribe for such patient as a physician, or to do any act for him as a surgeon."

Now that I have touched upon and endeavored to elucidate somewhat the character of evidence, it will be next in order to consider the subject of preparation for the witness box and the proper manner of giving evidence. The suggestions I am about to give you regarding the manner of giving evidence are offered with but one object—not to teach you to be skillful partisans nor defiant witnesses, but simply for this: that your evidence may be of such a nature, both as regards its arrangement and scope, that justice may be assisted by a clear and orderly statement of truth and the whole truth, and not perplexed by a disorderly combination of chaff and wheat, a hopeless entanglement of material and immaterial statements.

First, then, it is your duty to make yourself fully acquainted with and master of all the facts bearing on that part of the case upon which you may be called to give evidence. Your knowledge should be as far complete as possible. As an illustration of what I mean: no medical man is justified in venturing to give evidence on the results of an imperfectly conducted or half performed post-mortem. Because a death was sudden and you find on opening the thorax evidence of heart disease, you are not justified in neglecting the examination of the brain; death is sudden in some cases of cranial hemorrhage, and apoplexy may exist with it, or be caused by poisoning.

In all cases likely to be matters of judicial inquiry, *completeness of work* is absolutely essential, for two reasons: the one to avoid personal censure, and the other to further the interests of justice. Do not think yourself above a careful preparation for the witness-box; for the witness has a harder struggle than the cross-examiner (for it is easier to ask questions than to answer them). Hence by so much let your preparation be the more active and complete, and in this preparation arrange all your facts methodically and as far as possible chronologically; make your-

self perfectly clear on all dates and times. Where measurements, size, color, weight, etc., are matters of evidence, these should be carefully considered beforehand; sometimes an illustrative drawing is of great service in evidence. Thus, in describing cuts, stabs, bruises, enlarged joints, deformities, etc., a sketch of the injured part, showing the precise direction of a wound, at once renders the whole thing clear to the judge and jury, while simple description might fail. But though the drawing may be rough, remember it must be correct, or it is worse than useless.

Again, as an expert you will be called upon for opinions. The conclusions you would draw from the facts proved, demand your most careful consideration. The medico-legal opinion of any value, is the thoughtful, ofttimes tedious work of study and examination; and if in the quiet of your study you fail to come to any conclusions, do not attempt a wild conjecture in the hurry and excitement of the witness-box. To be accurate is ten thousand times better than to appear brilliant. Want of thought (laziness, in fact,) is a far worse crime than an error of judgment.

Before giving evidence, carefully distinguish between facts and opinions. That prussic acid and belladonna are deadly poisons are facts, but their precise method of action are matters of opinion. In giving evidence, use at all times when possible plain English. "A blood clot" is a better witness-box phrase than "an apoplectic extravasation." Speak of a bruise, rather than a contusion; of the belly, rather than the abdomen. Avoid exaggerated expressions.

In cross-examination never lose your temper; your best defence, if unfairly pressed, is perfect coolness. The honest witness can afford to be dignified. If you are asked a question that you cannot answer, at once admit it, with a plain, outspoken "I don't know." Nothing is more dangerous than for a witness to attempt to guess, for fear of being thought ignorant; for a manufactured answer suggests further questions, until at last the witness finds himself in a maze from which extrication is well-nigh hopeless.

But having once replied "I don't know" to a question, never

allow yourself to be further drawn out by the skill of counsel. For instance, you may be asked, "How long, in your opinion, was a certain wound inflicted before your attention was called to it?" To which you answer, and sometimes very properly, "I don't know." Take care; that is your ultimatum, for the next question may be, "Do you think it was a month before?" and should you be tempted to say "yes," the next question is certain to be, "Was it two weeks?—was it a week?" and so on, until your original "I don't know" appears, to say the least, ridiculous.

There are certain cases where counsel may compel you to say yes or no to a question. Having done so, however, you have then a right to insist upon giving any explanation you see fit; and seeing how practically impossible it is at times to answer a question by yes or no, a witness should always, if circumstances require it, insist on his right in this respect, lest his answer convey a wrong impression.

And now, in summing up the question of evidence, which I think is the most important (next to knowledge of facts) to the medical jurist, I can do no better than to quote the advice of an eminent jurist to expert witnesses.

He said: "Be the plainest man in the world in a court of justice. Never harbor a thought that if you do not appear positive, you must appear little and mean. Give your evidence in as concise, plain, and yet clear a manner as possible. Be intelligent, candid and just, but never aim at being unnecessarily scientific; state all the sources from and by which you have gained your information. If you can, *make your evidence a self-evident truth.* Thus, though the court may at the time have too good or too mean an opinion of your judgment, they *must* deem you an honest man. Never be dogmatic, or set yourself up for judge and jury; take no side whatever, but be impartial, and you will be honest."

We will next consider a few circumstances which may at times give rise to no inconsiderable amount of doubt or inquiry, and perhaps be the cause of much thought to the practitioner; but before reviewing some of the cases and questions which the

veterinary practitioner may meet with, a few remarks on their classification may not be amiss.

The veterinary medical jurist does not meet with the great variety of cases which fall to the lot of our medical brethren, the physicians. The life of a person can scarcely be said to depend on his evidence, as is often the case with the physician. An inheritance or the future welfare of his heirs may not depend on our findings at an autopsy, but these facts in nowise detract from the importance of those findings, for if the case comes before a judge or jury at all, whether a human life, a certain sum of money, or a person's rights and justification are at stake, all demand that truth and justice shall be done and the same exactness and obstacles may have to be overcome and combatted in the one as in the other, and the medical jurist can distinguish himself as well in a case where the mere rights, money or property of an individual are in the balance, as when a human life hinges on his knowledge or testimony.

I would be taking up too much of your time were I to consider the *modus operandi* of the various procedures which characterize the routine of the medical jurist. Suffice it to say, that facts must be sought and established, one (and not the least important) of which may be the death of the subject. It may seem to some of you an easy matter to do this, but after comparing the various signs of death and the numerous symptoms which frequently occur simulating death, you will find that in many instances it will require all your professional skill to even diagnose a case involving the question of death. I might here cite a case which came under my notice, in fact occurred to me.

I was called to see a dog, the pet of a family. When I arrived I found the dog—a skye terrier—apparently dead. I could not feel the heart beat, the eyes were glassy in appearance, and there was no movement perceptible. From these indications I did not hesitate to pronounce it dead, and the owner threw it into the yard, with a view to burying it on the following day; but imagine my surprise when the next morning both dog and owner walked into my office, the dog apparently in excellent health. Since this occurrence I have always found the majority of death symptoms present before I passed judgment on a case.

We can scarcely pass over the signs of death and their train of important circumstances; so I will briefly review a few of the signs and conditions of most interest to the veterinary medical jurist. The signs are divided into two classes, positive and minor; the positive signs are, first, the entire and continuous cessation of the heart's action; second, the entire and continuous cessation of respiration; third, insensibility and inability to move. The minor signs are included in the effects of heat or a flame to the skin; action of caustic; odor of death; changes in and about the eye; change in temperature; muscular flaccidity and contractility; commencement of putrefaction; the formation of adipocere. Any one of these signs require close attention, as they are greatly intensified or retarded by circumstances and conditions, such as exposure to air, age of the animal, effects of gases, moisture, chemicals, mode of death, etc. The position of a dead animal may be of importance in determining the cause of or manner by which the animal died.

The question might arise whether the body had been disturbed or tampered with since death. In deciding these questions we must bear in mind (admitting that in rigor mortis the flexor muscles are always a little more contracted than the extensors) that the position of the muscles at death, unless disturbed during the period of flaccidity (in other words, the position when rigor mortis supervenes), is the position during rigor mortis.

Without discussing numerous matters in detail, the following propositions are, I believe, scarcely open to question: If a dead and rigid body, with open eyes and dropped jaw, be discovered, fitting itself to the surface on which it rests, the muscles of the buttocks or other parts being flattened at the points of contact or pressure, the probability is that death occurred at the precise spot where the body is found. If there had been any interference with it, it must have occurred before rigor mortis set in. If a dead and rigid body be discovered, not fitting itself to the surface on which it is found or rests; that is, if the limbs be twisted and contorted while the surface is even, or conversely, if the body be straight and the surface uneven, the probability is that the place where the body is discovered is not the place where it died;

at any rate, it is next to certain that the body had been disturbed or otherwise tampered with after rigor mortis set in. The surroundings, straw, bedding, hay, etc., will also assist you in determining if the body had been interfered with.

In examining a body for bruises or injuries, care must be taken not to mistake cadaveric ecchymosis for bruises; their difference being familiar to you all, I will not detain you by describing them, but will go on to consider another and the last branch of forensic medicine which I shall touch upon in this paper. So I ask your still further indulgence while I endeavor to suggest a thought or two in connection with the post mortem examination. This is an inseparable part in determining the cause of death. So important is it that under no circumstances should it be undertaken under conditions of hurry, at an improper time, that is, by artificial light, when certain important appearances, such as discolorations of the tissues and traces of poison might and probably would pass unnoticed. In cases of grave suspicion, and where important issues are at stake, the post mortem should be performed by at least two independent experts. If the veterinary surgeon in attendance is in any way inculpated or his treatment called in question, it is undesirable for him to be present, although it is only fair that he should be represented by a friend.

I know of a case where a certain practitioner was charged by another with poisoning a patient with opium. A post mortem was ordered, and a friend was present on behalf of the practitioner. The examination was made by the doctor who preferred the charge. The post mortem revealed all the appearances of death by opium, but he did not state that the liver was in a complete state of fatty degeneration until questioned on that point. This would probably never have been brought out as the primary cause of death had not the representative of the practitioner who was in charge of the case been present at the autopsy. As a matter of prudence, therefore, neither the accused nor the accuser, nor, in fact, any one actually suspected, should be present during the operation, inasmuch as tampering with viscera and the contents of the stomach are circumstances not altogether unheard of in forensic medicine.

Thus I might go on describing the various precautions so necessary in forensic medicine, but as that is not the object of this paper, I have only hinted at a few things which I hope will set us to thinking and studying; for study, experience and observation are the three essentials to success.

Many cases come to us every year where the casual observer would be misled, particularly in the examination for purchase or sale of horses. While the deceptions practiced are ordinarily easy of detection to most of us, we occasionally require all our learning and experience to take us through.

While stock is owned, bought and sold, misunderstandings and legal complications will occur, and the veterinarian will be called upon very frequently to assist in solving some apparently mysterious circumstances in connection with loss, death, lameness or sickness of an animal, and the clearer his judgment, the more accurate his findings, the more manly and intelligent his conduct in all such cases, the greater will be the confidence reposed in his ability; and by his conduct the profession at large will be assisted to a higher plane of recognition from our judiciary, and by its influence receive substantial aid through the halls of legislation, thereby ennobling and raising it nearer the level of our medical brethren, the physicians.

REMOVAL OF CALK-BOIL BY LIGATURE.

By J. C. Meyer, Sr., V.S.

The generally unsatisfactory termination following the extirpation of such tumors induced me to select this mode of removal. Rarely do we find unusually good results recorded, even by renowned experts; still they all recommend excision of such indurated tumors which are obstinate to all resolvent remedies. Neither are there many supporters of the ligating procedure. Nevertheless, I determined that the next case that would be subservient to this purpose must undergo the experiment. Soon afterward the operation was put into effect. The elastic string was applied to the base of the boil. The groove between the ulna

and the tumor (which was hard, tough, free from pain, and of sound skin) was, notwithstanding its close adhesion to the former, sufficiently deep not to warrant a slipping off of the cord. The mare was returned to the stable, tied short, so that she could not reach it with the mouth. Showing no signs of discomfort, she was turned out to pasture two days afterward, from which she escaped the first night, and was not found until the third week, minus the cord, and the swelling so much diminished that resolution of the remainder could be relied upon. Thus my real aim was frustrated.

About a year ago, January 16, I was asked to perform the same operation on a carriage horse valuable for his reliability. The calk-boil attracted so much attention that the owner concluded to have it removed. The circumference at the base of the boil was 12 inches, without a pedicle-like diminution, hard and slightly sensitive. Upon parallel traction a string could be placed between the tumor and the ulna; not deep enough, however, to insure against displacement by the ensuing swelling. To prevent this, narrow tape was drawn through the skin at the base and partly on the morbid growth, and knotted so as to make a small loop. This was done at four different places, each about three inches apart. The elastic tubing of $\frac{1}{8}$ inch calibre was then passed through these loops twice, drawn tightly, and knotted. The horse was sent to his stall, tied short to prevent his lying down, and ice water applied for a whole week. The first three days the application was made hourly, and for the rest of the week every three hours.

Jan. 19.—Tumor somewhat diminished.

Jan. 21.—The enlargement same as on the third day, the hair underlying the bandage loosening. The constriction renewed, though not called for by relaxation of the cord nor any other deficiency.

Jan. 23.—Neighboring region somewhat swollen and sensitive. Skin next the outer border of the string separating from the tumor; an offensive watery secretion oozing therefrom.

Jan. 25.—Reapplication of the cord because the tissues had given way, about an inch deep. The exposed wound surface ap-

pears bluish-red, soft and flexible. Adjacent tumefaction diminished. The movement of the extremity stiff.

Jan. 27.—Gait still impeded. The remainder of the connecting medium of the tumor and its abode is about one-fourth, around which the cord is drawn closer.

Jan. 29.—The one-inch pedicle on which the abnormal growth now hangs is cut in two, after giving it another and last strangulation with a silken cord.

The separated compact tumor weighed 2½ pounds. The wound surface, measuring fully eight inches in diameter, was covered with a protuberance of about 1½ inches or more of superabundant granulations, which developed in less than thirty-six hours, and was not very promising for a speedy cure, so that the owner intimated that the second crop would not fall short of the first. However, the most sanguine hopes were realized. A concentrated solution of carbolic acid was applied every four hours on the fungoid formation.

Feb. 5.—The luxurious growth was under control. The rest of that auconæous appendage was cut off, which bled a trifle. Swellings on some of the pectoral muscles subsided; gait normal.

March 1.—The wound surface was even with the skin. The circumference diminished to about one-third. Phenylic acid and liq. ferri. sesquichlor. had thus far been applied alternately. From now on until cicatrization was accomplished, some time in May, villate solution was used.

Now that the hair is long, no one would notice the insignificant smooth and soft scar, unless attention was called to it.

I am not prepared to determine the effect of the cold fermentations, but the inflammatory reaction was not as severe as expected.

Whether there is any advantage in taking an elastic ligature for this purpose, I do not risk to judge from this single experiment. Reliable authorities—Prof. Dieckerhoff and G. W. Schrader—in giving their experiences on this special subject, recommend the common hemp string, by whieh they attained excellent results.

As soon, however, as opportunity offers (I have been looking

for one ever since, but in vain), I shall use the rubber tubing again, as it rendered me satisfactory services in ligating other tumors, among them two on the tail (melanotic), one on the hock joint, and one on the scrotum. All healed off without interruption. In short, this method is, in my opinion, preferable to extirpation.

THE ETIOLOGICAL MOMENT IN AMERICAN SWINE PLAGUE.

REPORT OF THE WORK DONE IN THE LABORATORY OF THE STATE UNIVERSITY OF NEBRASKA FOR THE EXPERIMENTAL STUDY OF CONTAGIOUS AND INFECTIOUS ANIMAL DISEASES.

(*Continued from page* 66.)

THE MOST PRACTICAL METHOD OF OBTAINING PURE CULTIVATION FROM THE TISSUES OF DISEASED ANIMALS.

Pathological exudations, such as used by Dr. Detmers, serve very well to inoculate animals with, either to test the character of a disease, and if contagious or infectious, to obtain, in most cases, absolutely pure cultivations of the germ by inoculating some sterilized gelatinous medium with the substance of some solid organ, with every precaution against contamination by adventitious germs. At the same time some small animal should also be inoculated from the same organs. When possible, the animal from which such material is taken should be killed rather than allowed to die. The cultures soon grow. They are examined and the pure ones used for the successive cultivation of any desired number of generations. At the same time the growth of the organism may also be tested in and upon any other media than the one first used. For primary cultivation agar agar and sterilized blood serum are most advisable, as they permit the use of the thermostat. In the meantime, the animals inoculated become ill and may be killed and tubes inoculated from their blood and tissues under due precautions; the resulting developments are then to be compared with those first obtained by microscopical examination and their deportment in the various media of cultivation. By this method one is enabled to get the organism in a

clear and isolated form at a much less expense to the eye and time than in any other.

Animals are then to be inoculated from the cultures, especially the species in which the disease occurs under natural conditions, and if the same clinical and necroscopical phenomena result, under these experimental conditions, and the same germ can again be cultivated and is invariably found in the blood and tissue, its pathogenetic history has been in part discovered. Cultivations should be made from every animal inoculated, but in the future, when making field autopsies, it will suffice to consider the natural phenomena and to examine the blood and fluids by object glass specimens. In obtaining material for cultivations from autopsies made in the field, it is best to have two one-gallon pails, made of heavy tin, with very tightly-fitting covers. One of these should be kept full of a five per cent. solution of carbolic acid and taken to the field in that condition. In the other should be a number of perfectly clean large napkins, soaking in the same solution, which should also be taken to the field in the same manner. The first pail should be emptied as soon as the operator is ready to remove the organs, which should be done as rapidly as possible. An assistant should be on hand, and as soon as the organ is free immediately wrap it up in one of the above-mentioned cloths, which he has previously wrung out, and so on with each organ. This serves to sterilize the outside of the organs, and they are ready to obtain cultures from, on arrival at the laboratory, which must be done with all the precaution of hot knives, etc.

The plate culture isolation method can also be used at any time, but the above is far more practical for primary studies.

PERSONAL OBSERVATIONS UPON THE BACTERIUM OF SWINE PLAGUE.

The micro-organism which, independent of any previous investigations by others, I have discovered and experimentally proved to be the cause of genuine American swine plague—the most common and frequent as well as devastating of all the porcine complications popularly termed "hog cholera," so far as we now know—has been obtained, in the previously described man-

ner, from every outbreak of "hog cholera" which I have visited in Nebraska during the summer, fall and winter of 1886. The first hog I examined was upon July 8, and I was fortunate enough to have a pure cultivation of one bacterium in every tube inoculated.

The field examinations and experiments will be reported in a future paper.

This organism is very minute, and requires at least 1-18 oil immersion, aided by the Abbe condensor in order to study its peculiarites successfully. My own work has been with an instrument made expressly by E. Leitz, of Wetzlar, Germany, which, while not costing as much, was proved by the most exacting tests to be equal to the best Zeiss; it is provided with a one-twelfth, one-eighteenth, one-twentieth oil immersion, the latter of which I have used in these studies.

For a long time I have been of the opinion that we are not exact enough in the differential choice of our language when speaking of phenomena of micro-organismal life, especially with regard to the differentiation between morphological and biological phenomena.

Morphological phenomena have reference to shape, size, outline, alone.

Biological to everything else connected with these organisms.

The mistake is too often made of speaking of the appearances of the micro-organisms, when colored, as morphological appearances, whereas they are unquestionably of a biological, chemical character; dependent upon the chemical affinities of certain parts of the protoplasm for the different coloring materials. While unquestionably, as in the case of the micro-organisms of the American and German swine plague, the "wildseuche" of Germany, rabbit and mouse septicæmia, and those of some other diseases, this coloring reaction of the germ differentiates its protoplasm into two distinctly separate materials chemically, and this differentiation manifests itself, to the eye of the observer, in a certain morphological sense; still the phenomena are of a biological and not morphological nature.

Again, the artificial cultivations of micro-organism in or upon

different media have their essential biological phenomena, in that the cultivations frequently assume certain characteristic forms in some special medium.

The condition of biological research, with regard to the pathogenetic micro-organisms, is fast getting so contradictory that investigators will soon have to come to some definite understanding as to the technical meaning of words in order to understand one another. In no sense is this fact so apparent as in regard to the oval organisms which seem to belong to the class of diseases which will eventually be known as the infectious septicæmia.

Koch has given the name "bacteria" to this class to distinguish them from the absolutely round organisms, micrococci, which color homogeneously, and the rod and twisted organisms. It is greatly to be regretted that Hueppe has lately thrown the whole question into chaotic confusion by classing everything but the various straight and twisted rods or threads as "micrococci," which should never be accepted or brought into general use.

The micro-organism of the true American swine plague is, then, a bacterium in its mature form. It is not a micrococcus.

It is oval, being at least twice as long as wide when fully developed, its length as a mature individual being about one-half the diameter of the red blood cell of a hog when examined in freshly drawn blood under the microscope and care is taken that no atmospheric or chemical influences interfere with the morphology of the blood cell.

It colors best in methylen-blue and methyl-violet, next best in gentian-violet and methylen-green, also very well in the other violets, especially in a variety known as Hoff's violet, but not as well as many other organisms in fuchsin. As has been pointed out by Loeffler and others in Germany, the coloring capacity of many of these dyes is increased by adding to saturated solutions of the same in the coloring glass an equal quantity of a solution of caustic potash 1-10,000 aqua.

The same must be fitted every time before using.

In coloring this organism the result will somewhat depend upon the length of time the covering glass specimen is exposed to the action of the coloring material, and the same is true with

regard to the action of alcohol in the dicolorizing of tissue specimens.

When not too intensely colored, its protoplasm will be found to consist of two chemically different materials which differentiate themselves over the body of the cell, so that the two poles, or ends, are of a more or less intense blue, violet, green or red color, according to the tinction used, while the center of the body remains colored. That the outer cuticle, or capsule, of this organism is composed of the same chemical elements as the plasma of its poles, is to be seen from the fact that a delicate line of the same color extends from each of the colored poles along the sides of the object to the other, embracing the uncolored substance or middle of the body. * * * *

What has been said above as to the tinction reaction of the only true germ of American swine plague proper, can never be controverted when the same materials and methods are used.

An intense degree of exposure to the coloring material will result in the clear space, or middle piece, of the cell-body also becoming colored, though not so intensely as the ends in general. It has been my experience that this uncoloring substance, under previously mentioned conditions, possesses somewhat more affinity for fuchsin and the red violets than for the blues and blue violet dyes. Methylen-green differentiates the protoplasma of this cell beautifully, but requires longer exposure than the blue and violet coloring materials.

This non-refraction, uncoloring substance, is a secretion of the pole-ends.

The pole-ends possess a much more intense degree of refraction, in uncolored specimens, than the middle piece; in fact, when examined without the Abbe condenser, these objects look like two micrococci very near together, and at one stage of their development absolutely like dipplo-cocci, or when three or four are attached together, like an attempt at forming short chains of streptococci, though I have never seen them build continuous chains. With the Abbe condensor and a competent lens, the white, non-refracting substance can, however, always be distinguished, save at one moment in the existence of this organism,

when the pole ends have an absolutely round, coccoid form. All these phenomena can be seen in an uncolored specimen, or in the living organisms in a stage of active proliferation in the so-called "hanging drop." Naturally, they can be still better seen when the coloring glass specimen has been colored. With regard to the hanging drop cultures, I have found it advisable to add a small amount of a freshly filtered aquous solution of coloring material to the sterilized boullion of the drop cultivation; the organisms take up the color at the pole ends, or refracting points, and become still more distinct. When added properly, the coloring material does not seem to affect their vitality.

Saturated alcoholic solutions of the dyes must not be used for this purpose.

Of all the micro-organisms it has ever been my lot to study, either in covering glass specimens, in life, or in tissues, this group of bacteria, with clear centers and colored ends, which form the sporules, is the most puzzling. One is certainly at a loss, at first, where so many cocci come from; this perplexity can never be overcome except by studying the developing phenomena of these micro-organisms in the hanging drop.

One sees cocci of various sizes and oval organisms of the general dimensions of the larger cocci, groups of three or four elements attached together, bodies end on, appearing like micrococci, and the mature object with its refracting ends and non-refracting middle piece, but never rods.

All these conditions or biological phenomena constitute a pure cultivation.

The method of proliferation is as follows:

First let me say that this micro-organism is most actively mobile in fluid cultivations, and that every one of the (to be described) biological phenomena can be seen, and are better seen, in a fluid culture than any other way.

The first biological phenomena to be seen—apparently so, at any rate—is the augmentation of the quantity or extent of the non-refracting (uncoloring) substance. This portion—the middle piece—of the micro-organism becomes longer, but no thinner. The refracting poles are thus placed at twice or even three times

the distance from each other which they occupy in the mature organism.

The next phenomena is—if you catch it!—an increase in length of the entire object and the diminishing in volume (thickness) of the non-refracting substance; the pole ends become longer and are only connected by a delicate thread of non-refracting substance. Detmers saw this distinctly, and describes it when he says: "If circumstances are favorable, especially if the temperature is not too low—a well taken point—these chains break up into smaller ones, consisting of one, two or more bispherical micrococci, which, in separating from their neighbors, spin or draw out a very slender thread."—Report, 1880–81, p. 187.

"The space, however, gradually widens till finally a separation takes place and each link or joint goes its way. * * * A competent objective will reveal the existence of an exceedingly slender thread—a flagellum—which gradually lengthening and finally snapping apart, constituted the connection between the separating joints. I have repeatedly seen a post flagellum, but so far have never seen one at both ends."—*American Naturalist*, vol. 16, p. 202.

The connection now breaks, and you have before you two large, coccus-like objects. The next act in the play requires educated and tireless eyes to catch it to perfection. The separated coccoid objects do not remain long round; they soon become oval by an apparently swelling process; the longitudinal diameter exceeds the transverse. In the meantime others have been going through the same process; others have remained attached to one another, for it sometimes happens, though not so frequently as has been said, by any means, that two or more objects are attached to one another and undergo this process together. If an object glass specimen be colored at this stage, the observer will see a most varied picture—it will almost always be so in examining cultures—consisting of large round cocci, smaller ones, the oval, or mature organisms with their peculiar ends and non-colored middle piece; and sometimes several of them united together; the first stage of proliferation when the object is two to

three times its mature length, the two colored ends still more distant from one another and connected by a fine filament. The next step is the ovoid coccus which has colored diffusely; it becomes still more oval; from it now develops the mature organism; the oval object increases, so slightly, in length, and a delicate, non-refracting, non-coloring or white line separates it into two parts and increases very rapidly in quantity, separating the two refracting ends which bound it on either side.

The mature organism is again before your eyes!

This phenomenon can best be seen in the hanging drop culture to which some coloring material has been added.

When the artificial cultivations have been held at a temperature under 25° C., these organisms assume a sort of dwarfed development; their bodies become shorter, or if of normal length they are thinner; the ends and non-colored middle piece being no longer so easily differentiated; the white substance is scarcely perceptible, and the coccoid ends smaller. In one culture one can see a perfect swarm of coccus-like objects of all dimensions, but none so large as in freshly sowed cultures. Such cultivations must be re-inoculated upon fresh material very frequently. They retain their vitality best upon blood serum or in boullion. They do fairly well upon sterilized agar agar, peptonized meat infusion developing in a dirty white mass. They develop rather poorly in gelatine, yet cultivations in this medium have more or less bio-diagnostic value. In quite old gelatine, which has become somewhat hard from evaporation, but not hard enough to crack upon puncturing it, they develop slowly and in small colonies along the line of puncture, which gives to the same the appearance of a delicate thread with small knots at intervals along its course; the knots corresponding to individual colonies. Cultivations in such old gelatine do not have the tendency to spread over the superficial surface that they do upon freshly made gelatine, because of the hardness of the surface and the want of sufficient moisture.

In freshly made meat infusion peptonized gelatine, the first seen bio-pnenomena are somewhat dependent upon the size of the wire and number of germs upon it, when the medium is inoculated. If the wire is delicate and the number of germs small that

are attached to it, the individual colonies will develop as in the older gelatine, especially at first; but they soon grow larger, and finally coalesce, forming a continuous development along the line of puncture. Along the sides of the same, the small, individual colonies are indicated hy its delicate serrated appearance. I have seen this organism, when inoculated into old gelatine, retain the isolated colonial appearance for a period of two months without any attempt at coalescence between the colonies.

They never cause the gelatine to become fluid.

They are as anærobic and ærobic; that is, develop equally well with or without contact with the air. They develop as a sharply circumscribed coating of a grayish-white color upon the surface of freshly made gelatine, but not too profusely.

They lose their virulent activities quite rapidly in, or upon, artificial cultivations, but not so rapidly when access to the air is shut off. Thus far I have only been able to test their virulence upon a very limited number of rabbits, mice and rats, and have tested them by some forty experiments upon hogs, on account of paucity of funds.

They will kill rabbits, when a small quantity (two drops) of a fresh and virulent culture is used, in from three to five days, and mice in from twenty-four to thirty-six hours. Rats succumb to larger quantities (ten drops) in from thirty to forty-eight hours, or more. Their action upon hogs varies greatly according to the amount injected and the locality chosen for such interference; but above all, the germs vary very much in virulence in different outbreaks and in different localities, even when pigs or hogs are inoculated directly with a piece of freshly removed spleen rubbed up in sterilized boullion. How long cultivations will retain their virulence I am unable to say at present, but I have been successful with a proportionately large quantity of the tenth generation of the first cultivation, on the 28th of October last, the material having been obtained the July previous.

They develop fairly well on potatoes, the colonies assuming a rich coffee color; that is, of good coffee when good cream has been added to it. On beets, turnips and carrots I have not observed any particularities worthy of mention.

The peculiar differentiation of this organism into refracting and non-refracting substances, said substances representing also a coloring and non-coloring material when properly tested, as well as its varied and peculiar biological modifications, have probably been the reason that this micro-organism has not been more accurately studied and described by previous investigators, especially by Dr. Detmers. These conditions demand the utmost consideration as well as most exact and delicate technique in studying their presence and location in tissues. They collect in large numbers in the capillaries, especially in those of the lungs and kidneys. The utmost precaution is necessary in the discolorization of tissues, The "Gramm method" applies well to them, but they can be colored equally well without it; twenty-four hours' exposure is necessary in order to obtain satisfactory results. But whatever is done, it will only be under very favorable circumstances and in the thinnest of sections and after the most artistic treatment one can find them in tissues where the full differentiation of their plasma can be distinctly seen. It can be done in every organ, but requires time and patience. In thick sections, or even in thin ones, the commonly seen object will be a coccus; if the section is not stained with some contrast color, the tissues themselves, being discolored, will interfere with one's seeing the uncolored middle piece, and the same is true of the contrast colored specimen, unless the organism is in a very thin section, and near its upper surface, and then lies transverse to the observer's eye; if end on, they appear as cocci; if oblique, the lower end is not seen, and a coccoid object only is visible.

In my full and final report to the Board of Regents, these conditions will be discussed in detail and fully illustrated by drawings from microscopical specimens.

As one of the purposes of this paper is to endeavor to place this organism into the class of Koch's "bacteria," as opposed to the latest views of Hueppe, I desire to call attention to two other organisms which I have come across in two entirely different diseases.

The first of these micro-organisms was found in the organs of the cattle killed by my orders in connection with the singular out-

break at Crete, Neb., which I have termed "Bovine Rabies," on account of the history given me, and also because the phenomena in the sick animals so exactly fitted into the descriptions of rabies in cattle as given in the most reliable text books on animal diseases. [See American Veterinary Review, January and February, 1887.] I can only say this, that if the disease was not rabies, then it is one that simulates it in every particular, and one never before described by any observer. The fact that I have been able to isolate one form of micro-organismal life in absolutely pure cultivations from the brain, spleen and parotid glands of these animals, makes me doubtful of its being rabies, because so many others have tried to do the same thing and obtained no experimental results. On the contrary, I have obtained a most singular result, which, summed up, is as follows: Dogs inoculated subcutaneously with four fluid grammes of a sterilized boullion culture, have died within two weeks from a general paralysis, beginning in the posterior extremities. One rat died under the same symptoms in exactly nine days from the time it was inoculated. In both cases the animals could not swallow; the mucosa of the stomach was injected and swollen and intestinal tract contracted. Further particulars I cannot give at present, and it would be useless to theorize upon them.

This microphyte undoubtedly belongs to the same species as that of swine plague, if such objects can be classed by their morphological and morpho-biological characteristics so far as artificial development is concerned. I shall show, however, that these characteristics are not enough to justify claiming identity for any two organisms that are apparently similar, *and that the one decisive test must be the experimental results in animals being exactly the same as occurs in natural infection.*

This organism has, as said, nearly every characteristic of that of swine plague in artificial cultivations, but it is much more difficult to keep it in an active state of extra organismal proliferation. When the cultures are fresh and one sees it in its mature form, it is slightly longer than the swine plague organism and has more non-refracting, non-coloring substance; it is also somewhat thinner, and the refracting, colorable pole-ends are not only smaller, but

more pointed; it presents all the difficulties of study that the swine plague organism does, but to a greater degree, because it thrives so poorly in all tested media; it is especially prone to what in these cases I call coccoid degeneration. It is an-and ærobic in gelatine, but does not form the isolated colonies in old, or other, gelatine along the line of puncture in any stage of its development. In contradistinction to the S. P. organism, it spreads very slowly over the surface of the gelatine, forming a dead-looking, non-lustrous crust, especially if the gelatine is not very fresh, which is very difficult of removal, requiring hard scraping with the wire to get any material, and then breaks up into small dry, crustaceous particles. It developes well on agar agar at 37° C., but the organism will be found very much dwarfed upon microscopic examination, except in freshly-sown cultures made immediately from the organ from a diseased animal. In old cultures, or after repeated cultivations, the latter will be found to consist almost entirely of coccoid objects of varying dimensions. Its best medium is sterilized blood serum. It does not cause the gelatine to become fluid. It colors best in fuchsin and well in the blues and blue-violets, but not well in the red-violets. Want of means has prevented the careful experimental testing of this organism, especially in cattle. Sub-meningeal inoculations have no value for me. If it should be the organism of rabies, it must produce it under as nearly natural conditions as possible—that is, by subcutaneous inoculations; and last of all, inoculated dogs must induce rabies in healthy ones by biting them, to make the evidence conclusive.

The other micro-organism was obtained from the freshly removed spleen of a heifer said "to have died from Texas fever," and placed in my hands within thirty minutes from the time the animal died.

Numerous inoculations were at once made from it upon sterilized agar agar under the usual precautions. This organism has not been properly tested, for want of means to procure suitable animals. It will kill mice in twenty-four to thirty-six hours. It required seven days to kill a rabbit, the animal having a severe diarrhœa towards the end and suffering from acute parenchymatous nephritis, with albumen and casts in the urine, but no blood.

This object retains its virulence under artificial conditions much longer than either of the others.

It is also oval, hence a bacterium.

It colors well in the usual tinctions, but diffusely, and does not differentiate into two different substances as the others do. On account of press of work, its manner of development has not been studied. Contradistinctionally to the other two organisms, it grows well in gelatine along the whole line of puncture at once, the individual colonies being marked by the delicate serrated appearance of the line and ends as an individual colony, the whole appearing like a pin upside down—(when large quantities of material are upon the wire, the S. P. organism gives about the same appearance in fresh gelatine). It also spreads over the exposed surface of the gelatine, as a delicate, lustrous, pearly gray coating, with great rapidity. It generates offensive gases, or a gas, which frequently form globules in the substance of the gelatine.

It does not cause the gelatine to become fluid.

My readers will, therefore, please take notice that here are two organisms that bear much similarity to that of S. P. in their manner of development, and that all three represent three absolutely distinct micro-organisms, as they are each from sharply different diseases—clinically—though they must all be classed as "bacteria"; that they are oval organisms, all having much in common in their artificial development; that neither fluidifies the gelatine, yet they have essential biological points of differentiation, the chief of which is that they each produce different clinical and necroscopical phenomena.

To this group of micro-organisms also belongs that of the German "schweineseuche," or swine plague, which it has been very hard for me to accept as identical with the American disease, but which recent experiences and more exact studies have about convinced me to be in reality the same disease. (My former position on this question can be seen by reference to the paper upon "hog cholera" read by my assistant, Dr. Thomas Bowhill, before the Ilinois Veterinary Association, Nov. 11, 1886, and published in the American Veterinary Review, December, 1886, and January, 1887.) My reasons for this change of opinion will be alluded to later on and treated in full in two papers—one upon

the nature of swine plague, and the other upon the pathological lesions of that disease. There are still other micro-organisms belonging to the same group, such as those of rabbit and mouse septicæmia, and the disease of wild and some domestic animals—deer, cattle and swine—known in Germany as the "wildseuche," (to which Hueppe has lately given the name of "septicæmia hæmorrhagica"), and, according to Hueppe, hen cholera also.

My chief reason for considering the question of the nature of the swine plague organism in advance of my full report to the regents of this University—which will be postponed until the whole story is completed—is that Hueppe has lately endeavored to show that all the diseases mentioned by him are etiologically identical, *because of the similarity of the morpho and biological phenomena of their germs under artificial conditions of life.*

The reason also of my introducing the two "unknowns,"—as I will call the bacteria previously mentioned—here is simply to say that if Hueppe is correct in classifying the micro-organisms of the disease mentioned by him as one and the same thing, he would be equally justified in claiming the same for these two unknown germs; for they are as nearly like the others in their morphological and cultivation appearances as those mentioned by Hueppe are to each other; it would also be just as logical, supposing these unknowns to be the cause of rabies and Texas fever, respectively, to assert that these two diseases are identical with the German "wildseuche" as it is for him to claim that the "wildseuche," "rabbit and mouse septicæmia," "hen cholera," and the German and even American swine plague are etiologically identical diseases; that is, caused by one and the same micro-organism.

(*To be continued.*)

EXTRACTS FROM FOREIGN JOURNALS.

INJECTION OF PURE TINCTURE OF IODINE IN SALIVARY FISTULÆ.

The injection of irritating substances into the ducts of the salivary glands, that of Stenon especially, in many instances proved to be the best mode of treatment in cases of salivary fistulæ re-

sulting from injuries to the excretory canal of the gland, and of all the substances which have proved most advantageous none have been found more useful in its applications than the pure tincture of iodine. The *Revue Veterinaire* of Toulouse reports two cases in which fistulæ were thus treated with excellent results, though with different phenomena:

1. M. Delamotte records the first case. It is that of a fistula of the left side, resulting from the cauterization of a sarcomatous tumor of the cheek with arsenious acid. Into the open mouth of the duct, 60 gramms (about two ounces) of pure tincture of iodine were slowly injected in such a way that the injection could reach not only the canal and its affluents, but also the acini themselves. A few hours afterwards, the parotid was quite swollen. A large œdematous swelling appeared, extending from the poll, the base of the ear, and the eye, upwards, down into the jugular groove. While the animal was eating, there was no escape of saliva from the fistula's opening, but a peculiar roaring and double expiration at the flank were noticeable. The swelling of the glands subsequently subsided, and excepting the formation of two small abscesses, which healed readily after being opened, no complication was observed and complete recovery took place in twenty-three days, but with the result of the complete destruction of the parotid secretion.

2. In a second case Professor Labat, of Lyons, injected the pure tincture of iodine into the Stenon duct of an animal which had been suffering with epithelial growth of the face, which had been treated by caustics, and by which treatment a large sloughing surface had been exposed. Two hours after the injection, the parotid region began to swell, and the next day the enlargement extended all over the gland into the maxillary space over the masseterine region and somewhat down the neck. This, however, soon began to subside, and towards the sixth day had entirely disappeared. The fistula, however, was entirely closed, and on the fourteenth day the recovery was complete.

ANTISEPTIC WADDING.

In a series of articles, Mr. Ray considers the advantages that will result in veterinary practice from the use of the ordinary or

antiseptic wadding in the dressing of wounds. According to the author, this mode of application possesses over the ordinary oakum method advantages which he recapitulates as follows:

1. The pressure which can be applied with wadding is soft, uniform and methodical.

2. It preserves an even temperature over the surface of the wound—it protects the parts much better against external injuries, and again (though this point is still in dispute) it protects the wounds against the effect of the access of surrounding microbes by acting as an excellent means of filtration.—*Revue Veterinaire.*

STRICTURE OF THE SPHINCTER ANUS—SUBCUTANEOUS MYOTOMY—RECOVERY.

A young cow had been for a long time suffering with constipation. It was only after violent efforts that she succeeded in passing a small quantity of fœcal matter. The general health had been fair, but of late her appetite had become capricious, and she began to lose flesh. Every form of treatment failed to give her relief, though by injections and feeding her with grass she seemed to improve somewhat. The fœces she passed were rather soft, and when ejected were thrown out with some strength through the contracted anus. Rectal exploration was very difficult and painful. The walls of the rectum had the normal thickness and suppleness and the mucous membrane was soft and smooth in its whole extent. While the exploration was made the arm was subjected to violent pressure from the sphincter, which, with the posterior extremity of the rectum, felt like a hard ring, regular in its whole circumference and free from adhesion to the skin or to the mucous membrane. It was, in fact, the sphincter anus and the corresponding extremity of the rectum, which was transformed into a regular ring, powerfully constricted. This diagnosis being accomplished, a subcutaneous section to the right and to the left of the ring was made with the curved blunt tenotomy knife, and without any complication, and but a slight hæmorrhage, the animal was relieved.—*Revue Veterinaire.*

SURPRISING FECUNDITY IN A COW.

By Mr. E. Claverie.

This is the case of a cow which, at her first pregnancy gave birth, after an easy parturition, to one male and three female calves. The process of delivery occupied about an hour and a half. The little ones were well developed and were all doing well.—*Revue Veterinaire.*

THE USE OF ANTIPYRINE IN VETERINARY MEDICINE.

By M. Kauffmann.

In the *Journal of Zootechnie* the author, after giving the entire history of antipyrine and its physiological effects in healthy animals, concludes by speaking of its therapeutical indications. He says: 1st, in therapeutics only the effects of antipyrine can be utilized, as the local effects are nearly null; and, 2nd, that among the general effects the most remarkable, and the one that must unite the most common and important applications, is its hypodermic action. From all the investigations he has made, the author, confirming those of many others, concludes, 1st, that in hypodermic injections, antipyrine lowers the temperature more rapidly and better than by internal use; 2nd, that by this mode smaller doses give better results than if administered through the stomach; 3d, that for hypodermic injections the best solution is that of one gramme of antipyrine to fifty centigrammes of water, the solution being made with heat; 4th, that the hypodermic use is never followed by any general or local trouble; 5th, that in very high pyrexia larger doses must be administered every hour; 6th, that it can always be substituted with advantage for the use of quinine.

Kauffmann recommends the following doses for subcutaneous injections: In a dog of medium size, one gramme, and in a horse of medium size, ten grammes. This dose may be repeated, however, until the temperature is diminished.—*Journal de Zootechnie.*

GLANDERS IN THE GUINEA PIG.

By MM. Cadeac and Malet.

On account of the great facility with which this little animal

can be used in cases of the doubtful diagnosis of glanders, the following five modes of inoculation are recommended :

1st. The insertion of solid pieces of virulent matter in a fracture made subcutaneously. This is best adapted for glanderous granulations or thick pus.

2d. Deposits of virulent discharges on the dermic surface exposed by the removal of the epidermis with a pair of sharp scissors.

3d. Superficially intercrossed scarifications upon which the glanderous discharge is spread.

4th. Subcutaneous injections, with Pravaz's syringe, of virulent liquid, prepared by the trituration of glanderous matter with distilled water, with subsequent filtration through fine, clean linen.

5th. Intra-venous or intra-peritoneal injection of glanderous virus.

The interval before the appearance of the symptoms varies according to the quantity of virus used. With large quantities the eruption of the local symptoms is rapid, indeed, almost sudden, the generalization being also rapid, and death by the acute form soon taking place. With small quantities the generalization is slow, and death by a sort of chronic process takes place also slowly.

Acute glanders in the guinea pig is fatal in from fifteen to twenty-five days, while the chronic form has an average duration of sixty days, and the life of the patient may last one hundred and thirty-two days.

MM. Cadeac and Malet say, in conclusion, that to realize all the advantages that the cobaye may offer, one must :

1st. Inoculate with virus as fresh as possible in order to avoid septicemia.

2d. Inoculate two animals at the same time for the same experiment.

3d. Make the inoculation in several places on the same subject.

4th. Inoculate in the flank, in the face when one uses scissors; on the internal face of the thigh when it is done with the syringe of Pravaz.—*Revue Veterinaire.*

CORRESPONDENCE.

CORRECTION.

COLUMBIA, BOONE CO., MO., April 25, 1887.

Editor American Veterinary Review:

DEAR SIR—In your editorial of the April number of your journal, page third, it is stated that the Massachusetts Veterinary Association is the only one, so far, that stands firm and admits only graduates to its ranks, and that if the United States Veterinary Medical Association will adopt Prof. Michener's very worthy amendment, this society shall be second in rank to follow this good policy.

I beg to state, sir, that this is an error. If you will kindly peruse the by-laws and constitution of the Missouri State Association of Veterinary Science, a copy of which I sent you long ago (and another I send now), you will see that this modest body, starting with about a dozen men, firmly refused from the outset all applications from any source excepting from graduate veterinarians from reputable veterinary institutions, and may admit graduate M. D.'s in good standing.

I learn from Dr. Lyman, of Boston, that their association was undoubtedly the first in this movement, since it started on that basis, and it is one of the oldest in the United States, I think. But I believe that the Missouri association, which was organized the 28th December, 1885, also upon the same basis (without knowing of any other veterinary body so organized), is entitled to the second place. This young, unpretentious body of a few (not over-rich) vets., has never had within its ranks a veterinary charlatan, and it has sternly refused the five dollars entrance fee of several five, ten, twenty and thirty year veterinary practitioners who had accidentally burnt (?) their diplomas, or lost (?) them in the ocean coming from the "ould country."

You will greatly oblige the Missouri Association of Veterinary Science if you will kindly insert this letter, or correct your statement in your next issue.

Your humble servant,

PAUL PAQUIN, President.

NEW JERSEY LEGISLATION.

HACKETTSTOWN, N. J., May 16, 1887.

Professor A. Liautard:

DEAR SIR—I have just been informed by Dr. Wm. Herbert Lowe, that the veterinary bill was allowed to be killed in the House. After passing the Senate, "as I supposed it had passed both houses and only wanted the Governor's signature," it was killed rather than make concessions which would legalize unqualified men.

Hoping you will make this correction and that the bill will have better success next time, I remain, yours very truly,

WILLIAM F. SHIELDS.

LIST OF VETERINARY PRACTITIONERS

REGISTERED IN WASHINGTON COUNTY, NEW YORK.

WITHOUT DIPLOMA.

David Filkins.....Sandyhill
Robert G. Clark.....Argyle
Albert M. McEachren.....Greenwich
Edgar M. Welling.....Easton
Thomas A. Brayton.....Easton
Lyons M. Brayton.....Easton
Thomas M. Brayton.....Easton
W. H. Breason.....Argyle

BY DIPLOMA.

Robert Weir, A. V .C.....Cambridge

VETERINARY LEGISLATION.

CHAPTER 166.

AN ACT TO AMEND CHAPTER 313 OF THE LAWS OF 1886, ENTITLED "AN ACT TO REGULATE THE PRACTICE OF VETERINARY MEDICINE AND SURGERY IN THE STATE OF NEW YORK."

Passed April 16, 1887; three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section three of chapter three hundred and thirteen of the laws of 1886, entitled "An Act to regulate the practice of veterinary medicine and surgery in the State of New York," is hereby amended so as to read as follows:

§ 2. Any person who has been practicing veterinary medicine

and surgery as a profession in this State for a period not less than three years preceding the passage of this act, without having obtained a diploma or certificate from a legally chartered or incorporated veterinary college, university or society, as provided for in section two of this act, must register on or before January 1st, 1888, after the passage of this act, upon making and filing with the clerk of the county in which he resides an affidavit stating that he has been so practicing veterinary medicine and surgery for the period hereinbefore prescribed.

§ 3. This act shall take effect immediately.

BILL KILLED IN THE LEGISLATURE OF 1886–'87.

AN ACT TO AMEND CHAPTER 313 OF THE LAWS OF 1886, ENTITLED "AN ACT TO REGULATE THE PRACTICE OF VETERINARY MEDICINE AND SURGERY IN THE STATE OF NEW YORK.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section two of chapter three hundred and thirteen of the laws of 1886, entitled "An Act to regulate the practice of veterinary medicine and surgery in the State of New York," is hereby amended so as to read as follows:

§ 2. No person shall be entitled to register as such practitioner unless he be a graduate of a legally chartered or incorporated veterinary college or university, or shall hold a certificate of qualification *issued previous to the passage of this act*, from a legally incorporated veterinary society, except as provided for in section three of this act.

AMERICAN VETERINARY REVIEW,

JULY, 1887.

EDITORIAL.

MALADIE DU COIT, OR DOURINE.—Its recent importation—has at length reached our shores—brought over by French stallions—adding another contagious disease to the troubles of American horseflesh—Professor Law formerly in doubt as to its presence—no doubts now remaining—many stallions, as well as a number of mares, affected with it—is under investigation by Dr. Williams, Assistant State Veterinarian of Illinois—our translation of Zundel on the subject. PLEURO-PNEUMONIA.—With the management of this, added to that of dourine, the Bureau of Animal Industry will have their hands full—the work of stamping it out vigorously prosecuted—Professor Law's good work in Chicago—official veterinarians appointed in the Eastern States—for the first time a chance seems to offer for the extermination of the pest in North America—provided the bureau is unhindered, the appropriation continued, and politics ignored. DISTILLERY MILK.—The investigation instituted by *Science*—varying opinions—Professor Law, Drs. Salmon and L. McLean on the subject. VETERINARY SOCIETIES—their rapid formation—their apparent moribund condition—the cause of their inaction—and the wrong of their failure—their duties to the profession. THE BOULEY MONUMENT—a last chance to contribute to its erection. VETERINARY DEPARTMENT OF PENNSYLVANIA UNIVERSITY—its first catalogue of graduates.

MALADIE DU COIT—DOURINE.—The presence of one more contagious disease, added to the other dangers to which our domestic animals are exposed, is at length officially reported. Dourine, or *maladie du coit*, has made its appearance in the West.

In a conversation with Professor Law, of Cornell University, a few years ago, we asked him if he had ever heard of the existence of this disease in the United States. We were discussing the ever important subject of the importation of contagious diseases, and we then expressed the fears we entertained of the ap-

pearance of dourine as an incident of the importation of French stallions, a business which was at that period becoming one of great importance.

If our memory serves us rightly, he said in reply that he had heard of the presence of some disease which very much resembled dourine, but that no cases of it had as yet come under his personal inspection in this country.

There is now no longer room for any doubts on the subject. Our Western papers mention it, and Dr. W. Williams, Assistant State Veterinarian of Illinois, is busily engaged in investigating an outbreak in De Witt County, in that State. Two *imported* stallions are reported to have died from it, and nine more are now under treatment. It is also said that forty mares have succumbed to the disease, and that some fifteen or twenty others are still affected; and a number of stallions have been subjected to quarantine.

This is an exceedingly important subject, and our friends of the Bureau of Animal Industry have a weighty responsibility devolved upon them. At the present time, when the importation of stallions from beyond the Atlantic has assumed the extensive proportions which it has in fact attained, the duty of protecting the interests both of the importers and the dealers of our great breeding centres becomes pressingly imperative. The disease is of too serious a character, and too fatal in its results, to be ignored, and all stallions brought to our various ports ought to be submitted to a rigid inspection before they are allowed to be distributed throughout the Western States, where, instead of the improvement of our stock, the effect of their presence and employment will be the spread of a disease so widely and fatally contagious as that which they will be sure, in a double sense, to propagate.

We hope Dr. Williams will succeed in making his investigation as thoroughly complete and exact as the importance of the case demands, and that, moreover, he will not fail to recognize the propriety of supplementing his good work by furnishing the Review with a copy of his report for publication, for the benefit of our constituency and any others who may thus become interested and curious in the discussion of the subject.

We begin, to-day, the translation of an excellent and timely article on the subject by the late A. Zundel, which, we believe, will be interesting and instructive reading to all who will give it their attention.

The following extract from the *National Live Stock Journal* contains a succinct statement of the facts of the case as thus far developed:

"Nine Norman stallions from Wapello, De Witt County, are in a hospital at Bloomington, suffering from a curious disease, which is said to have been brought to this country by imported stallions in 1885. Forty mares, it is said, have died from it already, and twenty more are still suffering from it. Assistant State Veterinarian Williams, of Bloomington, has spent some time in investigating the disease, and finds there is a very grave cause for alarm, unless the greatest care is taken in the matter of quarantine. He finds that two imported stallions have died from the disease, that ten are very sick, and some of them will die; also that thirty-five mares have died, and more are affected. This disease is communicated in breeding, It is believed that all the stallions affected are quarantined, and most of the mares. However, it is almost impossible to ascertain this. Many mares bred by affected horses have been shipped away, and bred to other horses, perhaps. Dr. Williams thinks that the most vigilant attention of the Live-Stock Commission and the heartiest co-operation of the people are demanded at once. The imported-horse interests of Illinois are very great, and unless the malady is promptly obliterated the most serious results may follow."

Pleuro-Pneumonia.—The presence of dourine and the labor which we believe it is likely to impose upon the veterinarians of the Bureau of Animal Industry, will, of course, not exempt them from the serious task of combatting other and kindred evils in which they are now engaged. The prosecution of their warfare with contagious pleuro-pneumonia must necessarily occupy so much of their time and attention, considering the thoroughness with which their work is carried on, that it must needs be that they have but scant time left to devote to other objects. According to recent reports, notwithstanding this, however, the work is being well attended to, though not without some difficulty, in Chicago, where Professor Law continues to be earnestly engaged, and to be laboring as assiduously as he formerly did while in New York, in the days of General Patrick's commission. In Virginia, in Maryland, in New York, in New Jersey, and, we believe, also in Pennsylvania, the work is now tolerably well organized, and the destruction of diseased and infected animals,

with indemnification of the owners, by appraisement, proceeds systematically under the supervision of the officers of the Bureau.

For once, perhaps, in the history of contagious pleuro-pneumonia in the United States, means seem to be effectively employed to stamp out the evil. With good work under the auspices of the General Government, and able assistance from the State governments, performed by a corps of competent veterinarians, it may be considered that the days of pleuro-pneumonia in the United States are numbered, *provided* the "sinews of war" are supplied by the necessary appropriations of money in sufficiently liberal amounts, and that politics, in the guise and form of Congressional M.D.'s, can be hindered from allying itself with the foe, and is stamped out as resolutely and as promptly as the enemy itself ought to be.

Distillery Milk.—The characteristics of this dietetic material has recently been brought to the attention of the scientific and sanitarian public, and our excellent contemporary, *Science*, has instituted a series of inquiries designed to settle the question whether swill-fed cows are capable of producing good milk for human consumption. The opinions elicited seem to vary as to the results of its employment, and while the general verdict seems to be adverse, there appears to be a disposition in some observers to regard as at least harmless the mode of feeding referred to.

The following quotations from *Science* present the opinions of three veterinarians, who have had ample opportunities for observing the effects of a swill diet and the results which follow its use, on the quality of the milky secretion:

[James Law, M.D., Professor of Veterinary Science, Cornell University.]

Being from home, I cannot profess to answer your questions as to the effects of swill-feeding on milk as I could have done had I been beside my library. I have been accustomed to see brewers' and distillers' grains fed to milch-cows without any noticeable evil effect on the milk. If fresh, these are, in the main, grain robbed of much of its starch and some of its salts. Even when slightly acid from preservation in a closely packed condition, it has not seemed to affect the milk injuriously. It is difficult to see how the same material, ground into a fine farina, and floating in a large amount of water, can be any more injurious, further than as the excess of the water must produce a relative diminution of the solids in the milk. But swill is not always fed in this pure and unchanged condition. As preserved for feeding purposes, it is often found to have undergone not an acid

fermentation only, but even a putrid one as well. In other cases it is alleged that it contains chemical agents of a more or less pernicious nature, that have been introduced with the object of securing a more abundant yield of alcohol from a given measure of grain; and in all such cases the milk cannot fail to be injurious in exact ratio with the baneful nature of the fermentation products, or of the chemicals introduced by the brewer. The question cannot, I think, be settled by a mere general statement of the effects of swill-feeding, but it must have reference to the condition and ingredients of any particular specimen of swill fed. I can easily understand two different observers experimenting at the same time, and reaching diametrically opposite results, because due regard has not been paid to the varying condition of the swill as it was fed, and the different conditions of life of the animals consuming it.

[D. E. Salmon, M.D., Chief of Bureau of Animal Industry, Department of Agriculture, Washington, D. C.]

As I have not the exact data at hand which would be needed to answer your questions properly, I prefer to write you a short letter on the subject. In my investigations of animal diseases, I have frequently had occasion to observe the manner in which cows are stabled in sheds where distillery refuse is fed, and I also have quite a clear idea of the way in which the milk is handled. In a general way I have watched the discussions of sanitarians in reference to the wholesomeness of milk produced in this way. In some cases, at least, chemists have reported that milk from cows fed upon swill was equally rich, and, from chemical tests, was as good as, and even better than, milk produced from cows fed upon country pastures. It is extremely doubtful whether such tests as these indicate in any degree the wholesomeness of such milk. From the nature of the food, stables where swill is fed are much more difficult to keep clean, and the milk produced in them is contaminated with more filth and foreign organic matter than ever should be the case in properly kept milk stables. This would indicate that such milk would undergo changes from the multiplication of microscopic organisms more rapidly than other milk, and that dangerous germs would be more apt to find their way into it. Some sanitarians contend that the albuminoid constituents of swill milk coagulate more firmly than in other milk, and that consequently it is much more difficult to digest. I have made no personal observations in regard to this, and therefore can give no personal information of value. The question is certainly an important one, and I hope you will be able to collect information which will clear up some of the disputed points.

[L. McLean, M.R.C.V.S., Brooklyn, N. Y.]

I have frequently made post-mortem examinations on the carcasses of such animals. The digestive organs of cows so fed are, as a rule, in an anæmic and atrophied condition.

Veterinary Societies.—Not very many months ago, a noticeable and promising movement seemed to have been initiated among the veterinarians of the United States, and we were hearing news from every quarter of the organization of societies for mutual edification, discussion, and the like; and occasionally it

even became our agreeable duty to print the "transactions" of these learned bodies in the REVIEW, for the benefit of our readers and whosoever might care for the discussion of the interesting topics which were offered for elucidation, in the form of original papers, reports of cases, and the like. For the last few months, however, we have heard no tidings from these societies. What is the cause of this silence? Has the interest of their membership in questions of veterinary theory and practice subsided? Have the meetings failed in their numerical attendance, and has consequent dullness supervened? Have they died as rapidly as they were born? In fact, has their mortality exceeded their fecundity? Where shall we look for an answer? Whatever may be the cause of the silence maintained by these State and county associations, it is much to be regretted that the good which might have been anticipated from their active existence and from the publication of their debates and reports, has not been realized. It is from sources such as these that the veterinary profession of America, as it now exists, must derive the material and the stimulus of its honorable existence; and if it is to be well appreciated by the public here, or obtain recognition elsewhere in the world, it must thus cultivate itself and assert and maintain its right to be, and its power to make itself felt.

We sincerely hope that this condition is not of a permanently lethargic nature, and that their speedy waking up will be quickly followed by a new life and revived activity, and a consequent praiseworthy acceleration in the scientific progress and achievement which will result in advancing the profession in the estimation of the people to a point not before dreamed of, though by no means unattainable.

BOULEY'S MONUMENT.—Our French contemporaries announce the approaching expiration of the term fixed for the receipt of the subscription inaugurated throughout the world for the erection of a monument to commemorate the memory of the greatest veterinarian of the age, the late Henry Bouley. In response to our invitation, American veterinarians have, to an estimable extent, proved their appreciation of the project, and the American subscribers will be represented by a comparatively respectable

contribution. But is the amount that has already been forwarded all that is to be placed to our credit? We improve this last opportunity to refresh the minds of our friends, and to urge those who have intended—but also delayed—to give, to hand in their offerings at once, in order that we may remit the final balance to the French committee, and close the account.

Veterinary Department of the University of Pennsylvania.—We have received a kind invitation to attend the commencement exercises of the first graduating class of the Veterinary Department of the University of Pennsylvania, which we were unable to accept on account of absence from the city. The following ten gentlemen form the graduating class of 1887 :

Charles M. Cullen, Hiram P. Eves, Simon J. J. Harger, Richard W. Hickman, Charles Lintz, Edgar Marlin, William B. Montgomery, John F. Vandegrift, Richard G. Webster, Charles Williams.

ORIGINAL ARTICLES.

MALADIE DU COIT—DOURINE.

By A. Liautard. *

The disease bearing this designation is insidious in its progress, complex in its nature, (affecting breeding animals of the equine and asinine species), and contagious by the act of copulation. It has been known only since the end of the last century, but is now common in Russia, Bohemia, Hungary, Prussia, Algeria, Syria, and France.

From the peculiarity of its mode of contagion, it is not liable to spread to other countries, in the manner of other contagious diseases, aud being, on that account, strictly limited to breeding districts, it is not really an epizootic. It has been wrongly assimilated to human syphilis, but the analogy is limited to the similarity of its causes and of some of its symptoms, and to its characteristic lesions, for it is never known to possess the charac-

* Translated from A. Zundel.

ter of the syphilitic chancre. It has often been confounded with other simpler affections, generally of a benignant kind, which are also communicable by copulation, but it differs from these in the fact that they are unknown to the equine family, though they are also met with in the bovine, asinine and canine families, and are never accompanied with general symptoms as serious as those of dourine.

History.—Nothing was known or even suspected of this affection until about the close of the eighteenth century. It seemed to be scarcely known in Russia or in the eastern countries. The first description of dourine dates in 1796, and is contributed by J. Ammon, who observed it in the horses of Frakehnen, in northern Prussia, where the disease existed until 1807. From that period it was observed in Germany, at various times and by various authors: by Waltersdorf, in the district of Bromberg, in 1815; by Havemann, in Hanover, from 1817 to 1820; by Naumann, at Frakehnen, from 1817 to 1818. In 1833 and 1839 it reappeared in Pomerania, where it was observed by Haxthausen, in 1840, and was mentioned by Rodloff and Hertwig in Silesia, and from that point its reappearance was prevented by a resort to severe sanitary measures. In 1821 the first description of the disease appeared in Austria, where it prevailed in Bohemia and Styria, and was described by Strauss and de Hayne. Since that period the disease has reappeared several times in that country, principally in 1826, 1827, and 1828. It was studied by Erdelyi, in 1835 and 1836, and in 1846 by Pillvax, and again in 1859 and 1862, by Marisch. From Russia, where the disease is frequently seen, there are but tardy notices, coming from Renner in 1843, from Kersting, and more recently from Busse (1857) and Jessen (1859).

It was first observed in western Europe in 1830, where it received its earliest mention in Switzerland (by Wirth and Kychner), and later in France (by Dayot and Lautour). A few cases are also mentioned in Wurtemburg by Hering. The disease is yet unknown in England, Belgium and northern France, while, on the contrary, it is frequent in southern France and Algeria. Information respecting Spain and Italy is lacking.

Signol first observed it in Algeria in 1847, where it prevailed fatally in some tribes, and seemed then to have been known by the Arabs for a long time. They gave it the name of *el dourine*. In 1851 and 1852 the breeders of southern France suffered from it, and it was then studied by Delafond, Louchart, Ivart, Ranch and Lafosse. Its next appearance was in 1861, when it was imported by stallions bought in Syria.

In these different outbreaks the disease has varied in severity, according to climate or season, and even the temperament and constitution of the patients; but it has always retained its typical character and symptomology.

Symptoms.—The disease presents both *local* symptoms, affecting the generative organs, and those of a *general* character, which are principally nervous, always accompanied, however, by the infectious feature, and it is according to the predominance of one or the other of these characters that the disease has received the designation of either the *benignant* (or *eruptive*) form or the *malignant*, which latter is the more severe and serious of the two. The symptoms vary according to the sex of the patient.

In the mare, where the disease often remains local, its existence at the beginning is betrayed by the symptoms of ordinary catarrh. The vagina becomes tumefied, and its products of secretion are increased; and a discharge, serous at first, but later becoming cloudy, thick, white or reddish-yellow, escapes from the vulva, which soon becomes puffy or hard from œdematous infiltration. The lips of the vulva are sometimes flabby, and at other times of a yellowish-red color, while again they may form hard and slightly unctuous ridges. The vaginal mucous membrane becomes infiltrated and discolored, varying from red to a purple hue, and the superficial capillary blood-vessels are often seen engorged and projecting, principally towards the vulvar opening, or the fossa navicularis, and about the clitoris. Small epithelial vegetations have also been observed.

Vesicles, varying in size and containing a yellowish liquid, are found upon the vulvo-vaginal mucous membrane, which in bursting give rise to superficial ulcerations, sometimes covered with a yellowish exudate, and sometimes with scabs, which cicatrize

slowly, but easily. In other cases, instead of vesicles, there are white spots, of very small size, and arranged in groups, which seem to be caused by the tumefaction of the follicles due to the exaggerated proliferation of the cells (Maresch). Rodloff considers this species of tubercle to be the most serious form of the disease. Sometimes the ulcerations are deeper, with a diphtheritic exudate, with infiltrated edges, paler, and of bad appearance (Roell). The cicatrization is very slow, and leaves after it thick, cordiform, starry cicatrices. Analogous losses of substance are also observed on the mucous membrane of the uterus. All these ulcerations secrete a liquid, more or less ichorous, which keeps up the vaginal discharge, which is ordinarily very abundant and of an ugly aspect. If it continues but a short time, it adheres to the edges of the organs and forms yellow, brown or reddish crusts. The tail and the hind legs become smeared and foul, and are at times even excoriated by the irritation it produces. When the disease is of some standing, the secretion is no longer thrown out regularly, but collects in the vagina and uterus until it is expelled by violent efforts at the time of micturition.

As has been already said, the disease in mares often remains local. In these instances the general condition is not ordinarily altered, though in rare cases there is a certain uneasiness, a continual agitation of the tail, and frequent attempts to urinate, etc. The appetite remains good, and the respiration and circulation continue normal. Hertwig and Lafosse have, however, observed abortions in the first month of gestation.

In mares of good constitution, the disease often remains stationary in the condition described, and there are no general symptoms. Complications, and especially those of paralysis, are rare in lymphatic and plethoric habits, while they are common in well-bred and nervous animals. While in the former the disease subsides in a few weeks—seldom lasting more than three or four months—in the latter it may continue as long as from six to eight months, and is commonly fatal. In stallions it may continue for years, but its duration is never so protracted in mares.

In cases where the disease has become complicated and the general symptoms have appeared, the vulva may assume a larda-

ceous consistency, become rough to the touch, and partially lose its sensitiveness. The vaginal membrane has then either a yellowish color, or, as often occurs, a bluish or marbled tint, becoming pale when pressed between the fingers, but soon resuming its color when the pressure is relaxed. The vaginal discharge, which escapes in a mass when the patient coughs or makes any violent muscular effort, irritates and excoriates the inside of the legs and the thighs, or any portion of the skin with which it comes in contact. The ulcerations are always deep. There is often a passive œdema of the abdomen, and on the perineum and on the extremities; and around the anus a swelling of the skin occurs which readily forms into an abscess. There is often subacute mammitis, which also ends in suppuration. At this time there is also an appearance of well circumscribed tumors on the body, at the shoulder, neck, chest, abdomen or hip, and less often on the extremities. They are rounded or flattened in form, and vary in width. These tumors are situated in the dermoid structure, continuing for one or more weeks, and disappearing by degrees as they are succeeded by others which show themselves at other points. These seldom suppurate.

A tumefaction of the lymphatic glands is often observed, not only in the inguinal, but in the maxillary region, and there is a discharge from the nose which simulates that of glanders and farcy, but is neither of those diseases. Weeping from the eyes always occurs.

About this time the nervous symptoms appear. Epilepsy and immobility have been mentioned, but the most common affection is a more or less complete paralysis of the hind quarters. While at rest, the animals move frequently from one leg to the other, and when in action they drag the legs, and evidently find great difficulty in moving forward. The dog-sitting position is often assumed.

When paralysis occurs, or even on the appearance of the general symptoms, there seems to be an improvement in the local troubles; but this is only of temporary duration, the disease continuing to progress and being accompanied by extreme emaciation, the paralysis extending forward, attacking an ear and one

side of the face, and bringing on a condition from which the animal never recovers—a metastatic pneumonia, an extensive arthritis and a purulent infection soon converting the suffering patient into a subject for a post-mortem.

(*To be continued.*)

GLANDERS.

By Veterinarius.

A Contribution for the Prize offered by the U. S. Veterinary Medical Association for Papers published in the American Veterinary Review.

(*Continued from page* 114.)

Importance of Glanders Bacilli as an aid in Diagnosis.

The diagnosis of glanders is an easy matter when the visible phenomena are present in *optima forma*. The whitish-green and viscid secretion flowing from one or both nasal cavities and drying in a thin yellowish crust on the alæ nasi; the presence of irregularly colored ulcers with a yellowish lardaceous base and tumefied circumferences in those parts of the nasal mucosa which are open to clinical observation; the irregularly swollen condition of the inter-maxillary glands, with their frequent adhesion to the neighboring osseous tissue, the ulcerations of farcy and the indurated lymphatics leading from them to the corresponding lymph glands; the swollen condition of one or more limbs, and, in stallions, sometimes of the testes; the rough appearance of the hair; the short, painful respiration which frequently occurs, and the emation so often present, are all symptoms which cannot escape the attention of anyone at all initiated in the phenomena of this dreaded equine malady.

In other cases, however, it often happens that this whole group of symptoms may be almost entirely absent, or only one or another may be present in a manner not conducive to the excitement of grave suspicions. Horses are frequently seen in which the nasal secretion is very slight and no ulcerations can be seen on the nasal mucous membrane; or, there may be an ulcer on the skin which shows no tendency to cicatrization, but without the cord-like conditions of the lymphatics being present; or, there may be the least

interference in the respiratory phenomena, which are rendered more susceptible by pressure upon the larynx, and coughing the animal. It is exactly such cases which most frequently contribute to the extension of glanders among horses, and extension of the disease to unsuspicious human beings.

Other diseases than glanders give rise to a more or less profuse nasal secretion, such as chronic inflammatory conditions of the nasal cavities or the sinuses of the head, diseased molars, and necrotic processes, as sequelæ of strangles.

Haubner proposed that trepanation of the capital sinuses be resorted to as an aid to diagnosis of such questionable cases, as well as the excision of an indurated submaxillary gland, auto-inoculation, or the inoculation of another horse, or some susceptible animal. As to trepanation, it is seldom that it leads to the desired result. More is to be expected from the examination of an excised gland; but as the characteristics of glanders are also frequently wanting, too much reliance cannot be placed upon this procedure. Auto-inoculation, or the inoculation of a suspected animal with its own secretion, is open to less objection; but no correspondence in the reports of authors is found regarding this; it is based on the theory that the animal having the disease does not render it immune to the eruption of secondary ulcerations when being thus inoculated.

The results of such experiments have been summed up by Roell, of Vienna, as follows: "The proposal of auto-inoculation for confirmation of the diagnosis in glandered horses gives only inconstant results, and has often disappointed me in cases where there was no doubt of the existence of glanders in the animal experimented upon."

The only sure means of diagnosis is the demonstration of the bacilli of glanders by means of cultivations of blood-serum and potatoes, by coloring with methyl blue, and by inoculations upon guinea-pigs or field mice, as has been previously described. I recently examined the lungs of an animal that died from rupture of the diaphragm. A few isolated tubercles were present in the lungs; they were of a whitish color. I examined them for the bacillus of tuberculosis, but did not find anything; but on stain-

ing with methyl blue and using an alkali, I was able to demonstrate the presence of glanders bacilli, proving that the tubercles were not those of tuberculosis.

DO EXPERIMENTS WITH PURE CULTIVATIONS OF GLANDERS BACILLI CONFIRM THESE STATEMENTS AS TO THEIR LOSS OF VIRULENCE UNDER SIMILAR CIRCUMSTANCES?

The following experiments were made: Silk threads were sterilized by exposure to a temperature of 150° C. for half an hour; they were then impregnated with material containing the bacilli, and these rapidly dried on a glass plate and placed in properly closed sterilized tubes until ready for use.

Material taken from the spleen of a field mouse or a purulent degenerated lymph-gland of a guinea-pig, became sterile in the course of a few days. Cultures upon blood serum or potatoes rubbed up in bouillon was used to saturate silk threads, which were then dried, retained their activity longer, though the period was somewhat varied. They developed actively after such treatment for four days; after eight days but few developed, while after three weeks' drying on the threads they had lost all activity.

A special experiment proved very interesting on account of the long time the desiccated material retained its activity. It was as follows:

A tube, filled with stiffened blood serum, was sown with a cultivation of the eleventh generation, and placed in a thermostat having a constant temperature of 37° C. On the seventh day it lost its transparency, and appeared whitish, with non-reflected light. The cultivation was removed from the surface of the serum with a sterilized platinum needle and placed in the fluid at the bottom of the tube, where it was held in suspension; a number of sterilized silk threads were then placed in this fluid for some hours, when they were taken out, placed on a glass plate and rapidly dried, and when dry placed in a glass tube for safe keeping. Two field mice inoculated with them died three days afterwards of glanders.

Two field mice were subjected, from time to time, to inoculation with these threads, the interval being longer and longer. The diagnosis in each case was made by coloring the material and

microscopical examination. The following is the course of these experiments :

Two field mice, inoculated with freshly-dried material, died on the 4th day, of typical glanders.

Two field mice, inoculated with the same material, after 4 days' desiccation, died—the first on the 3d day, of glanders; the second on the 6th day, of glanders.

Two field mice, inoculated with material dried for seven days, died—the first on the 3d day, of glanders; the second on the 4th day, of glanders.

After 10 days' drying, two more inoculated. The first died on the 4th day, of glanders; the second on the 5th day, of glanders.

After 13 days' drying, two were inoculated. The first died on the 6th day, of glanders; the second on the 7th day, of glanders.

After 17 days' drying, two were inoculated. The first died on the 4th day, of glanders; the second on the 6th day, *not* of glanders.

After 20 days' drying: The first died on the 2d day, *not* of glanders; the second on the 6th day, of glanders.

After 28 days' drying: The first died on the 3d day, of glanders; the second on the 4th day, of glanders.

After 32 days' drying: The first died on the 3d day, of glanders; the second on the 4th day, of glanders.

After 40 days' drying: The first died on the 4th day, of glanders; the second on the 5th day, of glanders.

After 60 days: Both died on the 4th day, of glanders.

After 89 days: One inoculated died on the 5th day, of glanders.

After 715 days: Four threads sown on potatoes; no development.

These experiments demonstrated, beyond doubt, that glanders bacilli that have been dried for three months may retain their biological activities.

It is not necessary to assume that permanent spores are formed by these bacteria, as others which do not form spores have been known to retain their activity for the same period under a similar course of treatment. When it is taken into consideration that the nasal secretion of glandered horses contains micro-organisms of various kinds, and that fermentive processes almost always occur, it can be understood why numerous experiments made with this material have given negative results. If, as has been shown, the dried bacilli de not retain their activity for over three months, it is still possible that they may retain action longer in the warm, moist air of stables.

This supposition can also be tested by experiment, by observing their conditions on different media after the lapse of varying

periods. A great number of cultivations were further inoculated after having been in the thermostat for from one to four months, and old cultures all proved to have died out. Those one hundred days old developed sparely, as well as those of ninety, eighty, seventy, sixty, fifty and forty days. Cultivations of four weeks developed in tolerable quantities, but unevenly upon blood serum and potatoes isolated colonies were generally observed. Cultures of from fourteen days to three weeks showed normal properties. It can therefore be seen that these bacteria do not retain their activity long, even when placed under favorable conditions to their continued development.

Action of Disinfecting Agents upon Glanders Bacilli.

Heat is among the best of these; its destructive action on the infectious material from glandered horses has been well known for a long time.

Bourgelat subjected purulent glanders material to distillation; product and refuse both inactive.

Abildgaard and Viborg found the same material inactive after being heated to 45° C.

Renault cooked it with the same result. Dr. Loeffler's experiments upon pure cultures of glanders bacilli were followed by the same experience; all cultures, whether the bacilli demonstrated an uncolored sporoid centre or not, proved inactive after being cooked once.

A potato cultivation which had developed at a temperature of 38° C. for a period of seven days, was rubbed up with a certain quantity of freshly distilled water until it became quite apalescent; 5 ccms. of this material was then placed in a number of sterilized test tubes, when each was placed in a water bath, at 50°, 60°, and 70° C., for ten minutes. On being taken out, some sterilized potatoes were immediately inoculated from them, while others were sown from the non-heated sterilized mixtures in other tubes. After the lapse of three days, the potatoes which had been sown from the non-heated tubes and from that heated to 50° C., were covered with an amber-colored mass, while the others remained free from any development. This experiment was re-

peated with material prepared in the same manner that had been heated tc 52° and 55° C. At the latter temperature the bacteria were found to have been killed, while at the former they retained more or less activity.

The subjection of glanders bacilli to a temperature of 55° C. is sufficient to kill them. This is the same temperature that kills anthrax bacilli which are free from spores.

Chlorine gas and carbolic acid have been recommended as the most trustworthy germicides.

Gerlach mixed four grammes of the nasal secretion from a glandered horse with fresh chlorine water, and after two hours inoculated a healthy horse with the same. Result negative. A piece of the septum nasi, covered with ulcerations, was placed by the same authority in a solution of carbolic acid, 1 to 24 parts of water, for 30 hours; inoculation negative. He also placed freshly cultivated nasal secretion in the same mixture for only a few minutes, and on inoculation the result was negative.

Reynal produced similar results with chlorine. Peach and others give similar testimony.

Dr. Loeffler experimented with carbolic acid, corrosive sublimate, chlorine water, and permanganate of potash. The material used was four-days-old cultures of the bacilli upon potatoes which were rubbed up with a solution of meat-infusion-peptone. Sterilized silk threads were impregnated with this fluid, and soon as they were dry and ready for experiment. The disinfecting fluid was placed in sterilized crystalization vessels to the amount of 20 to 30 ccms.

Experiment No. 1.—A number of such threads were placed in a 2 per cent. carbolic acid solution, and the same number in a 5 per cent solution. After the lapse of 2, 5, 10, 20, 30 and 40 minutes, they were removed and washed in distilled water and placed upon potatoes; the same being done with saturated threads that had not been so treated. After six days the last were seen to be surrounded by a yellowish-brownish covering, as were also those which had been subjected to the action of the 2 per cent. disinfectant. The development of those placed for 2 minutes in the 5 per cent. solution was not so prolific as was the case with

threads left in the 2 per cent. solution for five minutes. Threads left for five minutes in the 5 per cent. carbolic solution, and for ten minutes in the 2 per cent., yielded a few isolated colonies. All others remained sterile.

Experiment No. 2.—Somewhat thinner threads were placed in a 3 per cent. carbolic solution, where they remained for 2, 5, 8, 10, 15 and 20 minutes. After seven days' observation they still remained inactive. Isolated colonies developed on a few of those exposed for two minutes.

The exposure of purely cultivated glanders bacilli to a 3 or 5 per cent. solution of carbolic acid is enough to destroy them when in thin layers.

Similar threads exposed to a 1 per cent. solution of permanganate of potash for two minutes, give negative results on potatoes.

Chlorine water, containing 0.23 to 0.16 parts chlorine, killed the bacilli after two minutes' exposure.

Corrosive sublimate is very deadly to these bacilli in from 1 to 5 per cent. solutions. Even 1–2,000 and 1–5,000 solutions gave satisfactory results; two minutes' exposure to the latter solution was sufficient to prevent any development, which is strong enough for all practical purposes.

Tenacity of the Inficiens of Glanders.

Many observations on this point have been recorded. Text books often contain such statements as the following: That in infected stables in which glandered horses have stood for a variable length of time, healthy horses have soon become glandered after being placed in them; even in cases where they have been empty for four, six, eight, twelve or even eighteen months.

If such statements could be depended upon it would be necessary to assume that the bacilli of glanders developed permanent spores, which can only retain their activity under such circumstances. Satisfactory evidence of such assertions cannot be found in veterinary literature, and they are directly contradicted by experiments as to the tenacity of these bacilli.

Viborg seems to have been one of the earliest observers to give attention to this important subject. He says:

"If you dry glanders material at the ordinary temperature of the air, either in summer or winter, or in an artificial temperature conforming to that of summer, it soon loses its infecting activity. Experiments with such material in over one hundred cases had no effect. Even subcutaneous inoculations gave negative results."

The material used by Viborg was taken from an unquestionable case of glanders in a horse, and had been treated for eight, nine, and fourteen days.

Gohier seems to have been more successful, for he succeeded in infecting a mule from a harness that a month previously was worn by a glandered horse.

Renault soiled eight halters and blankets with the virulent products of an acute case of glanders, and then exposed them to the action of the atmosphere for twenty days, after which they were placed on the same number of healthy horses. Results negative.

Renault and Bouley inoculated a horse with the nasal secretion—that had been dried six weeks—of a glandered horse; result the same.

Gerlach spread the same secretion on a plate of glass and allowed it to dry; how long not mentioned. Result negative.

Galtier came to the conclusion that glanders material lost its infectiousness after being well dried for fifteen days.

It is thus seen that all three authors agree in asserting that desiccation destroys the inficiens in glanders material.

(*To be continued.*)

THE ETIOLOGICAL MOMENT IN AMERICAN SWINE PLAGUE.

REPORT OF THE WORK DONE IN THE LABORATORY OF THE STATE UNIVERSITY OF NEBRASKA FOR THE EXPERIMENTAL STUDY OF CONTAGIOUS AND INFECTIOUS ANIMAL DISEASES.

(*Continued from page* 137.)

Before considering Hueppe's hypothesis further, I desire to call attention to the organism described by Prof. Schuetz (of the Royal Veterinary School of Berlin) in the "Arbeiten, a. d. Kaiser-

lachen Gesundheitsamte, Berlin, 1886," though it was first seen and partially described by Loeffler in 1882, but Schuetz has the credit of establishing its connection with the German swine plague beyond dispute.

The discovery of Schuetz is of much importance and interest to us in the United States, because of the exact morpho, and cultivatio-morphological and biological resemblances; in so far, actual identity between the organism described by him, and the one described by Detmers in 1880, and independently discovered by me, and unquestionably proved to be the sole and direct cause of swine plague proper in this country, have been proven by inoculations with pure cultivations obtained by the most exact methods of bacteriological investigation.

Schuetz says: "The bacteria of the German swine plague have an oval form, and are very easily colored in methylen blue, gentian violet, etc. When colored in a solution of gentian violet they show an uncolored space in their center which is surrounded by a layer of colored substance. The quantity of this colored substance is greater at the poles of the organism, so that its ends appear more strongly colored than the middle part. When strongly colored they appear of a homogeneous blue.

"As these objects occupy an intermediate position between micrococci and bacilli, they should be looked upon as bacteria.

"They are 0.0012 mms. and 0.0004 to 0.0005 wide; their length is from one-third to one-half that of the diameter of red blood-cells of the mouse.

"They proliferate as follows:

"At first they increase in length and become about double as long as wide, and have distinctly rounded ends, and color in the same manner as the micro-organism in septicæmia in rabbits, so that from a third to a half of the body presents itself as an uncolored space between the distinctly colored ends. More exact observation shows that the colored ends are connected together by a band of the same substance extending along the sides of the organism.

"The ends become separated from one another by the disappearance of the middle piece. They at first appear round, but

soon assume an oval form, consequently two individuals are developed from each organism by fission.

"When this process proceeds rapidly, as we have found to be the case within the porcine organism, the microphytes do not attain the above given dimensions, but divide themselves so rapidly that the uncolored middle piece cannot always be distinguished. Under these conditions the successive generations become smaller, which is to be attributed to slower development. The younger generations are often exceedingly small, but are still distinctly oval and color profusely."—p. 380-81.

"When inoculated upon meat infusion, peptone-gelatine, one observes the development of numerous white points which either lie in groups or isolated colonies. The points gradually augment in size until they coalesce with those in immediate proximity, so that the inoculated puncture appears as a homogeneous line with punctiform excrescences along the sides. A grayish-white wall develops around the point of inoculation upon the surface of the gelatine.

"The organism does not cause the gelatine to become fluid." p. 383, l. c.

It can be readily seen that this micro-organism of Schuetz apparently—exactly—corresponds to the one described by me in its deportment in gelatine, and exactly in its microscopical and morphological appearances when stained.

Schuetz received fatal results in twenty-four hours, by inoculation with pure cultures in mice, and in two or three days in rabbits, which correspond nearly enough to my experiences.

His results in swine do not correspond with my experiences, the German organism appearing to be much more virulent.

For instance:

"One pig five months old, inoculated June 26, died June 27—time twenty-four hours.

"One pig five months old, inoculated June 26, died June 28—time forty-eight hours.

"One pig five months old, inoculated July 12, died July 14—time forty-eight hours.

"One pig five months old, inoculated January 16, died January 18—time forty-eight hours.

"One pig three months old, inoculated February 5, died February 14—time nine days."

(This last was an aspiration experiment with spray from a bouillion cultivation.)

I have not been able to produce fatal results in less than four days, and then, only in one case. A five months' old healthy pig inoculated with a portion of the spleen of the most severe case of natural infection that I have yet met with—according to the lesions—died on the twentieth day after inoculation.

In this connection it may be well to mention that the outbreaks of swine plague in Nebraska have been unusually mild the past year, and also to again repeat that the same germ from different outbreaks differs much in virulent activity. * * * *

On the 27th of November I visited an outbreak of swine plague at Valparaiso, Neb., which was of a most severe type, and, so far as necroscopical investigation extended, was characterized by pulmonary complications, and those of the lymph glands and chief parenchymatous organs.

The intestines were entirely free from any ulcerative or neoplastic products.

The micro-organism from these hogs was the same as found in every other outbreak I have visited, and was also of a very malignant character. A perfectly healthy pig five months old was inoculated in the abdominial cavity with six fluid grammes of a sterilized peptonized bouillion cultivation of this germ and died in about twenty-four hours, I must admit totally unexpectedly on account of previous experiences. Its blood and spleen were found to be swarming with the specific organism.

There was not a single serious organic lesion in the animal with the exception of the lymph glands, which were much swollen, moist and full of hemorrhages, which gave to the cut surface the same appearance as is seen in a large strawberry when cut in two.

I do not yet know whether this peculiar appearance of the lymph glands, as seen in all acute, or severe cases, of swine plague, can be considered as really pathognomonic to that disease or not, as I have not had sufficient experience in other porcine maladies

to venture an opinion. Should it prove to be true, it will become a very valuable diagnostic condition.

Since the reading of a preliminary announcement of my work by my assistant, Dr. Bowhill (*American Veterinary Review*, l. c.) I have made more experiments and observations, and am now prepared to make some radical, and perhaps seemingly ultra, announcements, which I am positive future investigations will confirm, opposed as they are to commonly received opinions. I will also state that these conclusions will be supplemented by convincing experimental and clinical proof in future papers.

I wish also to say that I have been decidedly misled as to the value of anterical lesions in swine plague, by the publications of other observers and writers.

These conclusions are :

1. That the American swine plague is, first—the most important of all—an extra organismal infectious septicæmia.

Characterized :

(a). By a peculiar swollen hemorrhagic condition of the lymph gland.

(b). By pneumonia of a peculiar character.

This is all the American swine plague consists of; other lesions accompany it, but are not essential to it.

2. That the only and genuine swine plague is caused by, apparently, the same germ as that discovered by Schuetz in the German disease; and, if the natural characteristics are the same, that the diseases are identical.

My conclusions are largely supported by the observations and conclusions of Dr. Detmers, who says:

"No matter in which way, or by what means, the schizophytes enter the animal organism and get into the blood. The first capillary system to which they come is the lungs, which may account for the fact that, in swine plague, morbid changes in the lungs, consisting of exudation, extravasation of blood, and, finally, hepatization, are never absent."

At least I have found them in every post-mortem examination: and in the last three years I have made about three hundred.

"Dr. James Law, of Ithaca, N. Y., (in his report to the Commissioner of Agriculture) records the lungs of some of his experimental pigs as 'healthy,' 'sound,' 'normal,' etc., which simply shows that the pigs were not affected with swine plague, and did not die of that disease.

"It may also be mentioned in all cases of swine plague most of the lymphatic glands are more or less enlarged, and that comparatively more schizophytes can be found in them than in any other part of the animal body."—*American Naturalist*, vol. 16, p. 301.

3. Swine plague proper is a strictly infectious disease, and not a contagious disease in any sense of the term.

4. That the so-called "characteristic" ulcerative and neoplastic conditions, so frequently found in the large intestines in swine plague, are not necessary complications in that disease; and, hence, are not pathognomonic to it.

(That is, they do not form the pathological ends of American swine plague.)

5. That death can be induced in healthy swine by inoculating them with an extra quantity of very virulent virus, without there being an essential lesion present other than those in the lymph glands, and more or less ecchymotic hemorrhage.

(In such cases the animals die of an infectious septicæmia only.)

6. That those cases of swine plague which are characterized by an intense cholerine discharge are more frequently free from the so-called "characteristic" ulcerative lesions in the large intestines than complicated by them.

7. That the cases characterized by the so-called "characteristic" intestinal lesions are more often accompanied by constipation until the last stages, than by diarrhœa.

8. The choleroid discharges are, in reality, those generally accompanying the last stages of septicæmia; and, hence, are not dependent upon ulcerative lesions in the intestines.

9. That the term "hog cholera" is a misleading misnomer, and that the disease is really a septicæmia, with the lesions in the lymph glands and lungs as its peculiar characteristic, but also

accompanied by the usual acute parenchymatous process in the chief organs in the body, liver, spleen and kidneys. Notwithstanding the fact that Law and some other observers report no lesions in the kidneys, every competent observer will find those organs the seat of acute parenchymatous disturbances in every case of natural infection; the cortex being opaque, anæmic and of a yellowish-gray color.

In a brochure entitled "Die Schwindsucht bei Schweinen" (phthitis in swine), 1875, under the heading "scrofulous enteritis," Roloff has described lesions in the large intestines which he thinks belong exclusively to that disease, but which, as will be seen, also occur in American swine plague.

As can be seen by reference to Dr. Bowhill's paper, the absence of these lesions in Schuetz's autopsical report was the reason that I then doubted the identity of the German swine plague with American. I then held skeptical views as to the pathognomonic value of these lesions from missing them in the majority of cases of natural infection upon which I had then made autopsies. As said previously, both experimental and field necroscopical experiences have since confirmed my skepticism more strongly; of which more in another paper.

It would be unjust to the facts not to say that Hueppe is inclined to look upon these lesions as belonging to the "wildseuche" in German swine, and hence to the German swine plague which he claims to be identical with that disease. It would seem that this question must be settled in Germany, as, if Roloff is correct, they seem to have more phthisis among their swine than we do. It must also be remarked that Roloff, who was a most dry and exact observer, does not describe a single lesion in the lungs or lymph glands that has been described by others, or as yet seen by me in American swine plague. He invariably speaks of the lymph-glands as "enlarged, but full of caseous centers."

The pneumonia of the American swine plague is invariably of a bronchial—caseous—type, often leading to gangrenous processes, but even in such cases I have failed to find caseous centers in the lymph-glands, and have invariably found the previously described swollen and hemorrhagic condition. If Roloff be correct, then the

specific character of these ulcerative, neoplastic conditions must fall to the ground entirely without other argumentation, as they will then be found to occur in two entirely different diseases.

The presence of the different micro-organisms in the two diseases can alone decide this question.

So far as our American swine plague goes, it knocks the bottom out of the theory of the Koch school with regard to the bacilli of tuberculosis being the cause of caseation, and, as I have already shown in another paper—(*Journal of Com. Med.* 1886) it is really due to an incipient weakness in the cells, aided by anæmic conditions.

(*To be continued.*)

THE VETERINARIAN AS A MEMBER OF SOCIETY.

By D. P. Yonkerman, Cleveland, O.

As the great human family becomes multiplied and civilization rapidly advances, the demands of life become increased and more complicated; but intelligence, which advances with civilization, redoubles the efforts made to maintain the equilibrium between the growth of populations and the necessary supply of food.

It is these demands which have brought the cultivation of the soil to such perfection—which have reclaimed lands not only barren, but positively injurious, because they were the sources of pernicious maladies and the laboratories of pestilential emanations.

These demands have also perfected and enormously increased in number the domesticated animals so essential to mankind, and it is entirely owing to them that commerce has become so extended between countries as to greatly diminish the chances of the occurrence of those terrible famines which so frequently ushered in the plagues of man and beast.

But on the other hand, as civilization removes or tends to remove the ancient generators of disease, it brings about changes which are not without drawbacks. The more artificial conditions

of life which are created, and to which the domesticated animals are forced to submit, bring into play new influences, which modify their constitutions in such a manner as to render them susceptible of general maladies of a new type and of a character corresponding to the artificial causes which induced them.

It is only by taking this view of the subject that we can account for the appearance of diseases which a few centuries ago were, so far as present accessible evidence leads us to believe, unknown. For instance, according to all written testimony, the foot-and-mouth disease of ruminants and swine is a comparatively modern affection; so also is the so-called venereal disease of horses; the typhoid fever, cholera or measles of pigs, and other maladies of a similar kind. The variola, a most destructive disease, can be traced no farther back than the ninth or tenth century, while the contagious pleuro-pneumonia of bovines only dates from the middle of the eighteenth century; at least, we have no satisfactory proof to the contrary. Certain exanthematous affections of cattle are also quite modern, and the so-called typhoid diseases of the equine species have been observed only for a comparatively brief period; and so with other maladies of the domesticated animals.

It must not be overlooked that the facilities for averting famine and promoting intercourse which commerce and speedy communication have brought about, are not without their pains and penalties, in exposing countries and states to the introduction of maladies which are foreign to them and which are frequently all the more serious and deadly the farther they travel from their home; for there are diseases of the pestilential kind peculiar to different countries, where they are maintained or generated, and which only appear in other regions as imported or exotic maladies. These belong more particularly to the contagious class, and they may be carried to countries widely separated from their own, owing to the vitality of the contagium, and become fixed in these, to the great destruction of the animals affected by them.

Trade and intercourse are necessary for the welfare of the human family, and man cannot exist without the assistance of certain animals, whose multiplication and improvement constitute an essential feature of civilization.

The dangers to which these animals are exposed, and, through them, the well-being of mankind, can only be averted by an exact comprehension of the diseases to which they are liable—an acquaintance with the various influences which operate to induce, maintain and propagate these diseases, and the establishment of a system of sanitary police efficiently organized and provided with preventive measures based on this knowledge.

The subject of veterinary sanitary science is of the greatest importance to every country. Its importance has, however, been only partially recognized by our Government, and the losses sustained through its neglect, especially in this country, are something appalling.

The fact, pointed out by science, that some of the most destructive of animal plagues can be placed completely under control of man, appears to have been almost or entirely ignored. Consequently no systematic attempt worthy of the name has been made to place restrictions upon the diffusion and destructiveness of some of the diseases with whose mode of extension, at least, we are quite familiar. The measures proposed and carried into execution have been nearly always as futile as they have been vexatious to trade and injurious to the public interests, and they have seldom been devised by those possessing a proper knowledge of the disease to be suppressed.

Having now given a faint outline of the relations of man to the lower animals, and the effects of advanced civilization and domestication on them, I hope to find you in a measure prepared to receive the student of their habits and diseases, both natural and artificial, as a benefactor and servant to the commonwealth of no mean worth.

The duties, and ofttimes grave responsibilities, which will devolve upon him, should entitle him to the consideration of society —for his profession is certainly as ennobling and important to the public weal as that of many other branches of science which I can call to mind requiring zeal, self-denial, scientific skill, and all those high qualities which the votaries of medicine have so frequently displayed.

For of all the profound and mysterious objects which sur-

round us, the animal body, in its higher development, is that which seems the very essence of mystery and complexity. The most minute and exquisitely elaborate organization is wedded to and dependent upon chemical affinities of an apparently inscrutable character. A wonderful agency—the nervous system—governs, while it is sustained by intricate and obscure processes; and yet we cannot tell the nature nor explain the laws which control its actions. All that is wonderful, beautiful and grand in creation appears to be concentrated in the higher forms of life, but in the closest alliance with obscurity, inexplicableness and perplexity to the inquirer. Diseases the most prevalent and familiar to us are yet hidden in their origin, and evidently in vain we exercise our skill in interrogating the earth, air and water, or the chemical and physical agencies which are everywhere in operation around us.

Some of the causes of disease may be so subtle, and yet so evanescent, that the moment they have produced their effects they may disappear, without our being able to distinguish them, or they may become impotent by assuming another form. Others may be manifest to our senses, but elude our investigation, and many doubtless lurk unseen, unknown, and defy our search. But though the etiologist labors under this great disadvantage, and though his search into the causation of disease must only too frequently be those of a passive observer, yet these researches are often capable of demonstrating the influence of causes on the disease they have developed, and of their capability of being neutralized or rendered less efficient.

In this respect the knowledge we acquire of the nature of causes gives us a means of establishing a system of preventive or prophylactic treatment which must ever form the most valuable and important department of veterinary science.

As the prevention or prophylaxis of disease must hold the first place in medical and sanitary science—and its importance cannot be over-estimated, for its object is to render the development of maladies impossible, and to preserve individuals or masses of animals from their invasion—the suppression or extinction of a disease, when it has become developed, occupies the next place, and is scarcely of less moment than prevention.

To prevent a disease is, to the man of science, to be able to recognize the conditions on which its origin and development depends, and to be competent to submit these conditions to such modifications as will nullify their tendency to produce the morbid conditions or hinder their operation. This necessitates a study of many subjects, and demands the exercise of the highest faculties of the human mind. And the suppression of a spreading disease requires, in addition to this knowledge, an acquaintance with the laws upon which its extension depends, and the best means for counteracting their effects.

But, though possessed of all this knowledge, the sanitarian, from a variety of circumstances, may not be able to utilize it wholly, or even in part, for the public benefit; so that the advantages to be derived from his studies may be partially or altogether lost, unless he can obtain the concurrence and aid of those who are in a position to frame laws and enforce their observance, with a view to applying this knowledge efficiently, and, of course, beneficially.

The assistance of the law-maker has, therefore, to be invoked, and to the political economist or legislator, who must in the first instance draw his inspirations from the sanitarian, preventive medicine, as applied to the domesticated animals, must appear a subject of the greatest moment. To be able to avert the ravages of an impending epizooty, may be to preserve his country from a great crisis; and to suppress a disease which destroys thousands of creatures—more particularly if the agricultural wealth of a State, consisting chiefly of useful animals, constitutes a large portion of its capital—is not only to spare it the direct loss which such a malady causes, but often to relieve it from anxiety and hardship.

For it must be remembered that the majority of the maladies which come under the cognizance of veterinary sanitary science, more or less directly affect every branch of agriculture, and that the damage they cause is not limited to the immediate pecuniary loss and inconvenience attending the inefficiency or death of those affected, but extends to the breeding and multiplication of animals, embarrasses one or more branches of commerce, and gener-

ally injures, to a greater or less extent, the welfare of mankind.

Not only are such diseases formidable by the damage they inflict, but some of them are most serious from the pernicious influence which they may exercise on the public health, either by their transmission to mankind by contact or accidental inoculation, or by the use of the flesh or products of the diseased animals as food. Some of the most dreadful and fatal maladies are thus occasioned.

And now a word concerning the duties and responsibilities of the authorities may not be amiss.

The State, municipal and county authorities should constitute, collectively, an unceasingly vigilant guardianship over the interests of the community; and viewing their important functions in this light, one of their duties, and on occasions one of great moment, is that of protecting it from the ravages of contagious diseases.

When a disease appears in a county, their duty is to act decisively and adopt all necessary sanitary measures to prevent its invading their own localities; or, if it has already done so, to limit or arrest its course and diminish its ravages to the smallest possible dimensions. Their responsibilities are therefore great in proportion as a disease is destructive and dangerous. They should see to it that the measures adopted are uniformly applied with regard to sanitary action, so as to obviate the discreditable, vexatious and injurious results that must arise from disjointed action—extreme rigor in one county, the grossest carelessness and laxity in another. Yet a certain latitude must be allowed to meet the exigencies of particular cases and emergencies; but this latitude imposes on the local authorities responsibilities which may become very heavy at times.

When officially informed of the existence or the apprehended invasion of a contagious malady, their duties are twofold: those of a general kind and in the interests of the community, and those of a particular character and having special reference to the interests of individuals—the owners of animals.

The duties of the veterinary surgeon during the existence of a contagious disease are very important, and his responsibility

may be said to be greater than that of any of those who have to officiate at this crisis. The duties incumbent upon him are those toward himself, his profession, his colleagues, the law, and the authorities.

I will discuss them under their respective heads, beginning with the duties he owes to himself:

The veterinary surgeon owes it to himself to study carefully these contagious diseases, to point out their dangers, and to indicate the best means for suppressing or arresting their progress.

During an epizooty it is the duty of every one, and more particularly of the veterinary surgeon, to bring every available resource to bear in combatting it. This intervention on the part of the latter constitutes his share of social responsibility during the reign of these great public calamities. True, as Reynal justly remarks, "the veterinarian will not receive the applause and acknowledgments of the physician whose devotion and self-denial increase with the toil and danger that is incurred during an epidemic among his own species," but the part the former plays, if more modest, is not the less meritorious.

In tendering his concurrence to the execution of the common task, the great and final aim of which is the welfare of the entire community, he is sure to find in the appreciation and sympathies of his fellow citizens the ample recompense which moves men to strive for the good of their fellow creatures.

The veterinary surgeon has not only the dictates of humanity to inspire him, and which is the sole incentive of the physician, but he has, in addition, those springing from the importance of his task in a monetary point of view.

The national fortune, as far as animals are concerned, is more or less at stake, and also the comforts, nay, the very necessities of life of large numbers of people may depend upon his exertions; the health of mankind may even be, and frequently is, endangered by the outbreak of an animal plague. It is, therefore, a duty he owes to himself to cultivate his intelligence and to maintain those moral qualities which alone can enable him to exercise his professional qualifications with credit to himself and advantage to others. His duties toward his profession are pretty

well summed up in his duties toward himself. Its value and status depends entirely upon the intelligence, zeal and proper conduct of its members. When a man practices a profession which gives him an honorable position in society, and to which he owes his means of subsistence, it becomes an imperative duty, as it should likewise be a grateful acknowledgment of these benefits, to devote himself entirely to its advancement in every legitimate way, and to demonstrate its importance and utility. At no other period, perhaps, can this be so well shown as in the matter of contagious diseases. The veterinary surgeon is, in the controling of these, in a position to testify to its utility and importance to agriculture and the public in general.

In his duty toward his colleagues it appears to be unnecessary to do more than assert that members of such a profession as that of veterinary medicine should be actuated by the highest principles of equity toward each other. All are bound by the closest ties to forward the interests of their common profession upon which they are all dependent. They should, therefore, be ready to assist each other; their unanimity, mutual respect and confidence are indispensable in so far as the public interests are concerned, and they are necessary in maintaining the honor of their profession. Concord and an absence of unworthy rivalry is required at all times, but particularly when a destructive disease is prevailing.

It is the duty of the veterinary surgeon to consult with his colleagues in times of difficulty and doubt, to communicate to them the results of his observations and labors; to discuss with them, when necessary, important questions; to enable them to profit from his researches, as he should profit from theirs, and, if need be, to publish these for the benefit of the places invaded or threatened by a contagious disease. In this way the members of the veterinary profession may afford most valuable aid in the localities where a malady prevails.

His duties toward the law are to be no less scrupulously observed. He should not be allowed to treat any animal affected with a seriously contagious disease until he has reported its existence to the authorities; and any infraction of the laws he should

be ready to give information of. The share in those measures for the suppression of a contagious disease which he may be called upon to undertake, ought to be strictly and conscientiously carried out, and with sufficient zeal to secure the best results.

As I have before mentioned, when a contagious disease appears in a locality, the authorities should take every possible precaution, and in order to do this must seek the aid of science. In serious outbreaks, where the disease spreads rapidly, and also in cases of lesser moment, the veterinary surgeon will be delegated to prescribe the measures for its suppression. In the performance of such a duty he is bound by every sentiment of honor and justice to devote himself entirely to his mission, which is one of great importance.

According to the nature of the outbreak he will more or less promptly report, to the authorities who have sent him, its chief characteristics, its gravity, and the best means of preventing its extension. In his communication with the owners of animals, however, he must maintain a judicious reserve, and if he prescribes medical treatment or private hygienic measures with regard to suspected or sick animals, he must also remember that he cannot recommend and enforce sanitary measures; to the administration alone belongs the power rendering these obligatory. Those which he may think it necessary to suggest, and, with the owner's consent, to carry into practice, are but provisional until sanctioned by the authorities. The veterinary surgeon is charged by these with the duty of carrying into execution, in healthy or infected localities, the general measures already described; and in order to accomplish his ofttimes delicate task satisfactorily, he should maintain a firm attitude against all interested solicitations and influences, acting with circumspection, guided by his conscience, and never departing from that spirit of deference and conciliation which is so essential in an agent intrusted with such a mission.

In his relations with the authorities the same influences should govern him. His recommendations and suggestions to them should be conceived in a practical spirit, couched in the clearest terms, and devoid of all technicalities which might mislead.

Representations as to the necessity for certain measures should be well founded and the urgency for their adoption brought prominently forward. If they are disregarded, the injurious consequences which may result ought to be pointed out, so as not only to protect himself from blame, but also to warn the authorities of the danger of their supineness or neglect.

Having shown the importance of the veterinary surgeon to a community during the reign of a disease, let us for a few moments consider his minor qualifications and no less important responsibilities.

In doing this I take it for granted that due allowance is made him for the various auxiliary branches of science, such as agriculture, geology, climatic influences, chemistry, botany, etc., without the knowledge of which he would be incompetent to counsel or assist in preventing diseases of a contagious character.

I will consider his position in society while practicing his ordinary avocation. In this he differs very little from the physician, being in every sense a public benefactor and servant, subject to call at all times to relieve some person's animal from distress or injury—ministering to the relief and comfort of the animal kingdom as the physician does to man. This ministering to the dumb brutes, who are unable to make known their feelings or portray their sufferings, and his skill in the preservation of these valuable creatures which man has domesticated, should alone entitle him to no little regard from all humanitarians. If through his skill he is able to relieve the sharp pains and sufferings which at times afflict our lower animals—often being caused by the fault or ignorance of their owners and the enforced, unnatural mode of existence consequent on domestication—he must, it seems to me, constitute a member of society whose services we can ill afford to dispense with. His counsel and advice regarding the management, breeding, care and feeding of domestic animals is often sought by breeders and owners with good results and a saving of time and money. In fact, his presence in a community is so necessary and important that a municipality without a practicing veterinary surgeon is to be pitied indeed.

When we look upon an animal taken away from its fellows

and viewed with regard to the beautiful and wonderful designs of creation as an organic entity, an astonishingly complex living machine, endowed with certain attributes, and whose existence is dependent upon the performance of various functions which are allotted to various organs of suitable material, we must conclude that the study of it in health and disease is worthy of the best endeavors of our most learned and intelligent citizens, and that the profession is worthy of the esteem and regard of all thinking men, of whatever occupation or position, and that instead of the pursuit of such a noble profession acting as a barrier to his entrance into the best society circles, it should of itself be an introduction thereto, as it is at present to all societies of learning and schools of science where merit and ability are recognized without regard to social position or influence.

EXTRACTS FROM FOREIGN JOURNALS.

TREATMENT OF TETANUS BY INTRA-MUSCULAR INJECTIONS OF CHLOROHYDRATE OF COCAINE.

By A. Villa.

The subject of the present report was a colt, eighteen months old, suffering under a severe attack of lockjaw, which had been contracted by exposure to a strong, cold draught, ten days after castration. Encouraged by his experience of good results in the use of cocaine in the reduction of an inguinal hernia, the author decided to try it for the relief of the trismus in the present case, and accordingly made two injections of a solution of chlorohydrate of cocaine in each of the masseter muscles, repeating the operation in the evening of the same day, the solution being made with 1 gramm, 20 cent., in 8 grammes of distilled water. A subcutaneous injection of half a gramme of acetate of morphia was also made, with a view to corroborate the effect of the cocaine.

The following morning the muscular stiffness was much diminished, and the animal ate his hay. Two more injections were then made, in the neck, along the sterno-maxillaris muscle, with 2

grammes of cocaine, the operation being repeated three times at intervals of twelve hours.

Two days later, the stiffness of the neck having so far diminished that lateral motion was easily performed, the cocaine was discontinued and was followed by alternate hypodermic injections of curare and of pilocarpine, with the administration of chloral per mouth. Complete recovery soon followed.—*Clinica Veterinaria.*

CASE OF ANURIA FROM RENAL CALCULUS, FOLLOWED BY DEATH.

By G. Cappelleti.

The patient in this case was a mare, 14 or 15 years old. She had been subject to repeated attacks of colics, especially after working, but they had usually been relieved by warm emollient fomentations and stimulating frictions over the loins.

The symptoms of the case were: Slight intermittent pains, followed by intervals of quiet, and apparent relief; but there was an absence of urination for twenty-four hours. Vesical and rectal exploration, with abdominal palpation, were negative of results. During two days symptoms of cerebral congestion were present, of indefinite continuance, and throughout that period there was still an entire absence of micturition and defecation, although the bowels were stimulated by active cathartics. Respiration had remained slow (7 to 8 per minute); the pulsation was 50; temperature 37.5°. Benzoic acid, in 1½ gramme doses, was given hourly, accompanied by a purgative of castor and croton oils. A few drops of purulent urine were passed during the night.

On the eighth day she passed into a comatose condition, had a fœtid diarrhœa, and on the ninth day the symptoms of uremia began to be more manifest. On the tenth day she died.

At the post-mortem the kidneys seemed normal externally, but being cut into, in their thickness, two calculi were found in the pelves of these organs. That in the right side weighed 20 grammes 7; that in the left, 24 grammes 45. They were elongated, cylindrical, smooth at one end, enlarged at the other, and reddish in color. Both were engaged in the ureters, and thus effectually obstructed the escape of the urine.—*Clinica Veterinaria.*

A PECULIAR FISTULA IN A DOG.

By M. Curatelli.

The subject of this paper was bitten by another dog in the left hip, and after the lapse of a year the wound had not yet cicatrized, but was the seat of an abundant purulent discharge. A narrow fistulous tract existed at the region of the wound, about five centimeters long, extending from behind forward, and reaching to the ilium. The granulations being cauterized, the bone was exposed; but expecting a natural sloughing, the author made no attempt to remove the diseased bone. After vainly waiting, however, a few days, he decided to remove it with the forceps. In doing this, instead of bringing out a piece of the ilium, a tooth of the dog that had bitten the patient was taken out. It was inserted point foremost, toward the iliac crest, and was fixed in the ilium, from which, though movable, it was prevented from coming out by the new formation which had partly closed the opening. The wound was dressed antiseptically, and closed entirely in a short time.—*Clinica Veterinaria.*

UNNATURAL COITION—PROLAPSUS RECTI—COMPLICATIONS—RECOVERY.

By M. Baisse.

A vigorous stallion had broken loose from his stall and covered a large male mule, and when the animals were separated, the rectum of the mule protruded as the penis of the stallion was drawn from it. The result was a large rectal hernia and prolapsus.

Two days after the accident had taken place, the patient was in good condition, and appeared to suffer but little from his trouble. The hernia protruded under the tail, where it formed a soft, painless, reddish mass, about the size of a child's head. The mucous membrane was thickened, congested, and in places lacerated. Defecation was somewhat difficult, and the fœces were dry and flattened. Nests of maggots were found between the folds of the membrane. The prolapsus was reduced and retained in place by a bandage, and frequent lotions of carbolized water were prescribed.

The next day the prolapsus had returned, and the inflammation had assumed a gangrenous character. The tumor was then freely scarified and again returned to its place, and laxatives of sulphate of soda and rectal injections prescribed. The animal made a rapid recovery, and was soon able to resume his work.—*Recueil de Med. Vet.*

TWO CASES OF GOITRE IN THE HORSE.

By M. Massot.

According to this author, the extirpation of the goitre is comparatively a simple operation, and is generally followed by radical recovery. The case he first mentions was that of an animal that had a double tumor, of the size of a large base-ball, which interfered with respiration by pressure upon the trachea and the laryngeal nerves. The other was that of a colt whose thyroid glands were assuming threatening dimensions. Both animals were subjected to the same mode of operation. An incision was made on each side of the neck, and the hypertrophied glands being easily enucleated, were twisted and a strong ligature applied at their base. The ablation was made without hemorrhage. A few stitches and simple dressings assisted the cicatrization, which was completed in about a month.—*Recueil de Med. Vet.*

LACERATION OF THE ŒSOPHAGUS.

By M. Laurent.

The author was called to this case by telegram, the urgency being evident. He found in his patient a valuable brood mare, seven years old. She had never been sick, and was in robust condition. He learned that about a week previous she had had a fall, but showed no signs of having received any injury from the accident. Since then she had been exposed to rainy weather, but had always eaten well. The day previous she was found loose, having with much struggling and great difficulty freed her head from the halter, and since then an enormous swelling had appeared on her neck, and she had refused her food. The swelling occupied the entire length of the neck. The larynx seemed to be

free from enlargement, but was very painful. She carried her head hanging almost to the ground; she was very dull; her pulse was quick and small; the conjunctiva was rather pale; the buccal membrane pale and hot; respiration normal; auscultation also normal.

Conjecturing that the trouble consisted of bruises and pressure upon the neck and its organs, received while the animal was trying to free herself from the halter during the night, and that it was a simple case of subcutaneous cellulitis of that whole region, local applications of vinegar and poultices of common chalk mixed with vinegar were prescribed, with a diet of soft mashes and grass. The condition remaining unchanged the next day, blistering of the swelling was resorted to, with apparently good effects. On the third and fourth day, signs of improvement seemed to be present to such an extent that the patient was almost considered to be in a state of recovery, when in the evening of the fourth day, another pressing call by telegram was received. The condition of the animal at this time was most pitiable. Her head was hanging to the ground, and the mouth and nostrils were covered with a dirty-white spumous liquid, of an offensive gangrenous odor, mixed with rejected food as it escaped. The enlargement had considerably increased; the respiration difficult; the head so swollen that the pulse could not be taken at the glosso-facial artery; the temperature reached 40°3′; the respiratory movement was increased, especially on the right side. And the poor animal was evidently hungry, though powerless either to drink or eat.

Fracture either of the trachea or of the larynx was then suspected, and a fatal prognosis was announced. This was verified by the death of the animal, which took place on the second day following. At the post mortem, the inferior face of the œsophagus, at about 25 centimetres from its origin, was found to have suffered a laceration about two inches in length, running through the envelopes, the wounded region bearing an exceedingly ugly aspect. Masticated food was found packed in the œsophagus, from the pharynx to the cardia. The trachea was healthy, but above it and above the œsophagus, between them and the inferior face of the cervical vertebræ, and extending from

the pharynx to the entrance of the chest, an enormous abscess was found filled with pus mixed with portions of food. This pus was of an infectious odor, and during life had escaped into the pharynx through an abnormal opening in its walls.—*Bulletin de la Soc. Cent.*

ANIMAL DISEASES IN PRUSSIA.

(*From the Central-Blatt fur Veterinar Wissenschaften, No.* 48, 1886.)

The following is gleaned from the report of Chief Veterinary Surgeon Dr. Hertwig, on the meat inspection in Berlin, for April, 1885–1886.

Of the 640,655 animals slaughtered in the central slaughter-yards of the city during the year, 3,978 animals were affected with the diseases mentioned below to such a degree of development that the condemnation of the whole animal was necessary:

Tuberculosis	698
Caseous pneumonia	2
Erysipelas	172
Icterus—Jaundice	64
Melanose	2
Dropsy	35
Insufficient development of the meat	40
Loathsome condition	57
Bloody condition, bruised, and stuck too late	30
Inflammatory diseases	11
Swine plague	2
Actinomycosis in swine	2
Actinomyces in the muscles in swine	60
Echinococcus in the muscles	7
Cysticercus cellulose	2,587
Trichinosis	143
Calcareous concretions	56
	3,978

The total number of those with morbid changes, of which single parts and organs were condemned, amounted to 43,899.

Tuberculosis was fixed upon 1,920 beeves, 7 calves, and 2,438 swine.

The degree of development and the spread of the disease in the body of these animals was very diversified. In 183 beeves, 5 calves and 510 swine, it was already general, making the condemnation of the meat necessary, whereas in the remaining cases the affliction was local, and at that time the prevailing opinion was that the transmission of the disease to the human being, upon partaking of such meat, is not to be feared. In these cases the meat was released and the diseased organs condemned. On the whole, 6,329 parts and organs were condemned. Although, as already stated, the transmission of tuberculosis, or the perniciousness of the meat of tuberculous animals, is the prevailing opinion and is supported by the most prominent experts, the same is not correspondingly dealt with everywhere. On the contrary, many examiners decide according to their particular conception. While some consider the consumption of tuberculous animals injurious in every case, and accordingly condemn it, others release such meat, so long as the animal is in well-nourished condition, even when general tuberculosis exists.

In consequence of a difference arising in a special case, the Ministerium of Medical Veterinary Affairs was petitioned for instruction and advice as to the injuriousness or palatableness of meat of tuberculous cattle, whereupon, with the approval of the Minister of Agriculture, the following circular was issued on June 27th, 1886 :

" A condition of the meat of tuberculous cattle is generally then considered injurious to health when the muscles contain tubercles, or if the tuberculous animal shows emaciation, even if there are no tubercles found in the muscles ; while, on the other hand, the meat may be considered palatable if tubercles are present in one organ exclusively and the remainder is still in good condition."

Actinomycose was observed in cattle 21 times, 19 times in the form of jaw swellings, and once in the lungs. In swine this disease was met with twice—once with swellings on the udder and destruction of bones, and once in the form of swellings on the udder only, destroying nearly the whole udder.

The presence of actinomycotic appearances, or suspicious ap-

pearances of actinomycosis, always requires a strict examination of the animal in this direction. As soon as a second affected spot is detected, or the local affection exists in a more aggravated stage, accompanied by putrid decay, etc., we must not hesitate to consider the meat affected and condemn it. As long, however, as the disease appears only locally, existing in a slight degree, and the tissues of the swellings are solid, this measure does not seem to be necessary, according to the present knowledge of actinomycosis.

Of the 143 trichinous swine, 132 were of native breeds, 3 of Russian, 4 of Servian, and 1 of Saxon; 53 times the trichinæ were very numerous, 111 they were capsulated and all alive, 17 times dead and living trichinæ were present at the same time, and 15 times lifeless ones only could be detected. Repeatedly it happened that several swine (5 to 6) which were sold by one and the same dealer were trichinous. Suspecting that these animals came from one farm, requisite researches with the aid of the police authorities were instituted, but in a single instance only was the supposition verified. In other instances the researches proved unsuccessful, because shortly before the sale the swine, in company with others, were found in different hands and their identity too difficult to establish.

As soon as trichinæ in the same earlier stage of development are detected in a number of swine out of one farm, it may be assumed that the source of contagion is to be found on the farm in question, and that other swine kept there are also trichinous. To make these suppositions sure by investigations is of great importance to the public welfare, because thereby it is possible to remove herds affected with trichinæ and to keep the suspicious swine under surveillance until they are slaughtered and examined.

BOOK NOTICES.

DISEASES OF THE ELEPHANT. By John Henry Steel, V.S., A.V.D., M.C.R.V.S.

If veterinary medicine, in its true definition, means that domain of the medical sciences which comprehends the diseases of

all domestic animals, the work which has been written by Mr. John Henry Steel, M.R.C.V.S., upon the diseases of the elephant, will be accepted by veterinarians wherever this animal has been reduced to a state of domesticity, as a book which has been for a long time a necessity. But it is not alone in this character that this little manual of Mr. Steel's recommends itself to favor. It is also as a contribution to the literature of comparative medicine that it is valuable. We have received a copy and have enjoyed its reading, and cordially recommend it to everyone whose peculiar engagements or duties may involve an interest in the subject matter of the treastise. The first part of it treats of the natural history of the elephant, and of its uses as an agency and element in the equipment of modern armies as well as an animal of transport; while the second part, in eleven chapters, makes the reader acquainted with the ailments to which this animal is liable, closing with the therapeutics and uses of medicines which find their principal indications in the treatment of the diseases referred to. The book is printed by Mr. W. H. Moore, at the Lawrence Asylum Press, Mount Road, Madras, India.

VETERINARY SURGICAL PATHOLOGY AND PRACTICAL MEDICINE.

Another Indian book comes to us in the work above named, for which we are indebted to the kindness of the authors, Professor John Burke and Mr. R. W. Burke. It is said to be the first volume, and is illustrated with numerous plates, taken from original drawings and photographs. We offer our thanks to the anthors for the compliment, but we are sorry to be obliged to confess our inability to render to the work the justice of a review, on account of a defect in our educational acquirements, which were suspended before we had quite mastered the Hindoo tongue. If we may judge by the headings of some of the subjects, and by the quality of some of the illustrations, we are sure it must be a valuable addition to Hindoo veterinary literature.

CATTLE AND THEIR DISEASES. By Dr. Murray, of Detroit, is announced among recent publications, and is highly spoken of by the *Breeders' Gazette.*

EVERY MAN HIS OWN VETERINARIAN. By G. S. Heatley, M.R.C.V.S. is published by the O. Judd Co., of New York.

LIST OF VETERINARY PRACTITIONERS

REGISTERED IN SUFFOLK COUNTY, NEW YORK.

John Andrews, (not regular or college graduate).....Deer Park
Geo. W. Clock, " " " " .....Islip
Geo. Clemence, (25 years practice).....Blew Point
Walter Downs, Jr., (20 years practice).....Riverhead
Nicholas A. Downs, 20 " " .....Bridgehamton
Max Frankel, 5 " " .....Greenport
G. W. Gilbert, (New York Veterinary College).....Bayport
Adolph Gierasch, (3 years practice).....Riverhead
Henry Hallock, 18 " " .....Bridgehamton
Joseph R. Hammond, (American Veterinary College).....Port Jefferson
R. C. Jones, " " " .....Port Jefferson
John Lindsay, (Columbia Veterinary College).....Huntington
Herbert W. Law, (6 years practice.....Riverhead
Wm. W. Nicoll, 10 " " .....Southampton
Jeffrey Smith, 5 " " .....Greenport
Chas. Smith, Jr., 20 " " .....Patchogue
C. W. Sperry, 5 " " .....Babylon
Geo. Ticehurst, 3 " " .....Bayshore
Geo. C. Wells, 25 " " .....Southold
Robert Waters, 10 " " .....Mattituck
Ed. L. Waters, 10 " " .....Jamesport
John Williams, (colored, 5 years practice).....Smithtown

NEWS AND SUNDRIES.

State Veterinarian to Iowa.—Gov. Larrabee, of Iowa, has re-appointed Prof. M. Stalker State Veterinary Surgeon.

An English Appreciation.—The American Veterinary Review for April; Vol. XI. No. 1. Edited and published by Prof. Liautard, M.D., V.S. (Holt Brothers, 119 Nassau Street, New York), price 50 cents. We Britishers may say what we choose, but there is no question, as veterinary practitioners, we are about half a century behind our transatlantic brethren if we may judge from the very excellent literature they supply us with.—(*The Veterinary Review.*)

New Veterinary Association.—About fifteen veterinary surgeons met at the Kirby House, Milwaukee, April 13, to take the preliminary steps necessary towards incorporating their State

association. There were present from outside the city: E. S. Mason, Beaver Dam; S. J. Moore, Oshkosh; C. Loftus Martin, Janesville; R. C. Whitcomb, Monroe; T. H. Nicholson, Oconto; Frank Hall, Merton, and J. Q. Smith, Madison.

A law recently passed by the Legislature to regulate the practice of veterinary surgery made it necessary for the State Veterinary Association to have a legal standing and requiring its incorporation.

No Pleuro-Pneumonia in Minnesota.—In reply to the report that a fatal disease had made its appearance among cattle in some portions of Minnesota, which it was feared was pleuro-pneumonia, Dr. Hewitt, of Red Wing, secretary of the State Board of Health, states that there is not a case of this disease in the State, and he does not understand how such a rumor was started.

Quite Apropos.—Doctor's office, St. Louis. Enter a lady with a sick dog. "My dear Dr.——, you must not be angry with me, but won't you please cut off this tumor on poor Fannie's flank?" "Well madam, I would do anything to oblige you, but this is a little out of my line. Why don't you take your dog to a veterinary surgeon?" "But, doctor, those veterinaries are so expensive. I supposed you could do it just as well."—*St. Louis Republican.*

A Colt with Three Eyes.—We doubt if the colt below described could open its three eyes much wider than the one who reads his description, as given in the Prescott *Hoof and Horn*: Col. Chas. W. Beach is the owner of a two-weeks-old colt, foaled from a fine brood mare, the sire being an imported Percheron. Its peculiar features are three eyes, two of which occupy the usual locality in the head, while the third is placed midway between them. The eyes are all endowed with vision, and the only apparent difference between them is that the middle one is much the largest, while the other two are of normal size. Each eye is in possession of an upper and lower eyelid, delicately fringed with eyelashes, but while the two in the customary locality diminish gradually towards the outer edges of the head, the lids belonging to the middle eye look, when closed, like the segments of a circle.

In addition to these three eyes, the colt sports a double set of nostrils, both of which are perfectly defined, and in breathing, each set appears to work in harmony with the lungs. Aside from these features, the colt is well shaped, and in a very healthy condition.

State Veterinarian of Missouri.—The Legislature of Missouri failed to pass the bill establishing the office of State Veterinarian and providing for the appropriation of $2,000 for the support of the same. The Senate of the Kansas Legislature failed to confirm the nomination of Dr. Holcombe, as State Veterinarian, and we understand, the appropriation passed was too small to provide for the expense of keeping a State Veterinarian in active service.

Longest Reported Period of Gestation in a Mare.—Mr. Z. T. Moore, of Traer, Ia., writes, that Mr. Thomas Green, of that place, has a pony mare that dropped a mare foal after a well-authenticated period of gestation reaching twelve months and twelve days. The colt is said to be bright and strong.

New Appointments—Dr. F. H. Parsons, D. V. S., has been appointed assistant veterinarian to Montana. Dr. J. Walrath, D. V. S., and Dr. W. Devoe, D. V. S., have been appointed inspectors to the Bureau of Animal Industry.

Regulating Veterinary Practice in Illinois.—A bill was introduced in the Legislature to compel veterinary surgeons before practicing in Illinois to secure a certificate of their profession and skill from some veterinary college. The bill did not reach surgeons who have practiced five years at the time of its going into effect.

"Aerobic" and "Anaerobic."—A suggestive idea, which has not yet led to any definite results, has been taken up by M. Arloing, and concerns an attempt to learn more of the nature of infective diseases by the aid of chemical physiology. The aerobic microbe, it is believed, would live at the expense of the oxygen of the blood, and we should consequently expect that this would show itself in the form of alterations in the quantity and quallty

of the chemical substances discharged from the body. It has been found that the amount of carbonic acid discharged from the lungs in cases of charbon and gangrenous septicæmia diminishes during the whole course of the fever, and especially towards its termination. This diminution in the discharged carbonic acid appears to have begun soon after the inoculation of the poison in the case of charbon; whilst in the case of gangrenous septicæmia, for some hours after the inoculation the quantity of carbonic acid exhaled was increased. It is believed that this difference in the amounts of carbonic acid discharged during the hours immediately following inoculation is to be attributed to the difference between aerobic and anaerobic organisms.—*London Lancet.*

Veterinary Examination of Stallions.—The English Cart Horse Society has settled the important question of ascertaining the soundness of stallions in a plain common-sense manner, worthy of a society instituted for the purpose of improving the breed of cart horses. By condition 10, "a veterinary surgeon will attend at the show to inspect all animals before the judges make their final award; and no award will be made to any animal which is not free from disease detrimental to breeding sound and healthy stock." Under this condition, a customer for purchasing or hiring any stallion exhibited at the Cart Horse Show may depend that all the stallions passed by the veterinary referees, whether winners of prizes or not, are sound.—*Medical and Surgical Review, London.*

The Actual Cautery and The Thermo-Cautery.—Of late cauterization has been performed by means of the thermo-cautery, but this practice is not so good as the one which it displaced. First, platinum requires a much higher temperature to redden it than iron, the consequence of which is that the thermo-cautery produces a much more severe burn than the iron cautery, the parts touched being burned to the fourth degree, and the heat radiating beyond them. Consequently elongated burns are produced, which leave indelible cicatrices. Secondly, the pain produced is very severe, while patients bear a repetition of the actual cautery with little or no fear.—*Ibid.*

AMERICAN VETERINARY REVIEW,

AUGUST, 1887.

EDITORIAL.

DOURINE IN THE WEST.—Our prophecy of years ago is slowly coming to a reality—little by little European contagious diseases obtain a foothold on this continent—no measures taken to prevent their importation—will rinderpest be allowed to come?—dourine creates quite a panic—the action against it in Illinois—the opinions of veterinarians—our suggestions. VACCINATION IN ANTHRAX—we have always advocated it—was it out of patriotic enthusiasm?—no—the extracts from the Annales de l'Institut Pasteur, and the report of Prof. Robertson, substantiate our opinions. A NEW SUTURE NEEDLE—another good invention by Dr. Peabody—the new needle is a good instrument. VETERINARY DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA—the grant of $50,000 given by the Legislature vetoed by the Governor—our anticipations and hopes disappointed—better luck next time—all it needs is patience, preseverance and honesty of purpose. UNITED STATES VETERINARY MEDICAL ASSOCIATION AND REVIEW PRIZE—conclusion of the paper on glanders—its issue as a whole and its distribution amongst the members of the Association—now for the Committee on Prizes to be prepared for the next meeting. REPORT OF THE ENGLISH HYDROPHOBIA COMMITTEE—sweeping approval of the subject—more of it in another issue.

MALADIE DU COIT IN THE WEST.—We little thought how nearly we approached prophecy when, years ago, we expressed our apprehension that all the communicable and contagious diseases belonging to the domain of veterinary sanitary medicine, long prevalent on the other side of the Atlantic, but strange heretofore to American experience, were likely in due time to find their way to our shores, simply in consequence of the lack of suitable measures of obstruction and exclusion on the part of our authorities and people. It truly seemed that these plagues were to be allowed to find their way to the United States, not only without molestation or hindrance, but even without recognition, until they should become

so diffused and naturalized throughout our widespread territory as to involve an expense and difficulty in their suppression altogether too formidable to contemplate, if, indeed, it were possible by any means or at any cost. And who will undertake to estimate the amount of public expenditure and the extent of the private loss attendant upon any concerted and efficient measures of suppression, with such an evil for the object of encounter?

Almost all the diseases of a contagious nature have now been brought to our land from Europe, mostly without attracting any proper degree of attention, and, until lately, without being met with any precautions against their diffusion through the whole country; and the question is often discussed in our veterinary meetings, whether rinderpest itself may not some day be announced as another distinguished visiting stranger, coming to renew its old associations with its Old Country companions—pleuro-pneumonia, foot-and-mouth disease, tuberculosis, and especially our latest importation, *dourine*, all of which may now be accounted American diseases, and none the less because they are merely naturalized foreigners and not native-born aborigines.

Veterinarians of European education, who have been practicing in the United States, have more than once suggested the propriety of watching against the importation of this most serious affection of solipeds, and practitioners of this class have, therefore, been but little surprised at the news of the outbreak in Illinois.

The people, however, are alarmed, and as Illinois has already suffered severely by the outbreak of contagious pleuro-pneumonia, and they are not anxious to suffer further loss of the same character, they are quite prepared to meet this new invasion with all the energy, and to apply all the means towards suppression, which may be demanded by the stress of the emergency.

A full discussion of the subject was had at a recent meeting in DeWitt County, and resulted in the adoption of the following resolutions:

To the People of DeWitt County:

WHEREAS, A disease exists among horses in this county, known as "Maladie du coit," or epizoötic chancre, and, whereas, all good citizens should esteem it a privilege and duty to aid in every possible way in its suppression, and

WHEREAS, A mass meeting of the citizens of the county has been called for the purpose of considering the condition that exists, and determining upon the best methods to be adopted for the speedy suppression of the disease, and

WHEREAS, The undersigned have been appointed to present a plan of action for the consideration of the citizens assembled in mass meeting, the following statements and recommendations are made:

1st. The existence of the disesse can be traced to the year 1885. Its origin has not been satisfactorily determined.

2d. There are from twelve to twenty stallions in the county afflicted with the disease, and a number of other stallions have been exposed, and are liable to communicate it to mares.

3d. There are from forty to fifty mares in the county afflicted with the disease, and from twenty-five to thirty of these mares have died from the effects of the same. A large number of other mares have been exposed to the disease, which your committee cannot say are actually diseased.

4th. The committee recommends that the diseased horses, and those that have been exposed, should be quarantined by the State Board of Live Stock Commissioners, and that the owners of such stallions be not allowed to breed or sell said stallions; and in case the veterinary surgeons report said afflicted stallion or stallions as incurable, that the owners of said stallions castrate the same at once.

5th. The committee recommends that the mares that have been affected or exposed should likewise be quarantined, and if the report from the committee of experts appointed by your body say that the disease is in them incurable, in such case that all such mares as have been actually diseased shall be branded with the letters V. D. on the left hip, and that they never be bred again, and that W. H. Wheeler, of Clinton, be appointed with authority to brand such mares.

6th. That mares exposed in 1886 or 1887, even when the disease has not appeared, should also be quarantined, and that said mares shall not be bred during the years 1888 or 1889, until a certificate of health from some competent veterinarian has been given.

7th. That committemen be appointed in each township whose duty it shall be to prepare four lists, viz.: Of diseased stallions, of exposed stallions, of diseased mares, of exposed mares, in their respective townships, and report the same to John W. Bowren, Secretary.

8th. That a committeeman be appointed from each township, whose duty it shall be to see that the restrictions placed upon the sale, transfer and breeding of exposed and diseased animals shall be strictly complied with, and that they shall prosecute all cases of violation of said regulations.

A number of veterinarians were present at this meeting, amongst whom were Professor Law, State Veterinarian Dr. Casewell and his assistant, Dr. Baker, and others.

The general measures recommended by these gentlemen, besides a strict quarantine and other sanitary precautions, were the

castration of the stallions and *spaying of the mares*, to *insure against the spread of the disease by their use for breeding purposes;* and a very radical, but, we consider, most excellent decision of the meeting, was to *kill every infected animal.* We are inclined to consider these the most desirable of all the measures applicable to the emergency, with the indispensable addendum of a provision strictly prohibiting the importation of any stallions or mares without a perfect and clean bill of health, certified by the proper officials of the county, town or department from which the animals are brought, and which shall be supplemented by a rigid veterinary inspection at the place of landing, and, if necessary, a subsequent quarantine. Such a process of prevention as this will overbalance, beyond computation, the trouble and cost of measures which may subsequently become necessary through improvidence and stupidity in the beginning.

Vaccination in Anthrax.—A reference to the files of the Review for several years past recalls to our recollection a number of articles in which we have stated our views on the subject of vaccination in various diseases, and we are quite satisfied to reaffirm our position, and to feel assured that our advocacy has been fully justified by the benefits which have followed the practice and rewarded our suggestions. This advocacy of the theories and experiences of Pasteurism has been in some instances reproachfully charged against us as an error resulting from patriotic enthusiasm.

The reproach may be a just one, but, notwithstanding this, no one can question the integrity of our views and the conscientiousness of our advocacy, or truthfully deny our willingness to confess our demonstrated errors, when discovered.

We refer, on this point, to our course in respect to the matter of hog cholera, in connection with the Pasteur prophylaxy. We formed the opinion that inoculation with the Pasteur vaccine was the best means of protecting the swine-owners of the West from disaster and loss, and we so affirmed. We discovered our error, and acknowledged it; and to-day we declare that we now oppose as strenuously as we then defended, the use of the means in question.

But if the disease treated successfully was not hog cholera,

it ought to be anthrax, in its various forms, and Pasteur's vaccine for anthrax fever has sufficiently achieved its proofs.

A glance at the tables to be found in the "Annales de l'Institut Pasteur," will prove the value of this mode of treatment, and the reports of the experiments made in England by Professor Robertson, which were laid before the Royal Agricultural Society, also show that in that country, where anthrax in its various forms is sometimes so extensively prevalent, we cannot any longer afford to ignore the advantages of vaccination. A few of our friends here have, at our suggestion, already tried some of the vaccine of Professor Cornevin, and also that of Professor Chauveau, with which we had furnished them; and the result, to which we will refer in another issue of the REVIEW, has been of a most satisfactory character. It will give us pleasure to furnish any of our friends who wish to make trial of it a supply of the vaccine for further experiment or use.

A NEW SUTURE NEEDLE.—Only those who have been taught by their experience of the annoyance, can testify to the vexation they have sometimes encountered in the want of a proper needle or holder, by which they could make a firm and solid suture without painfully puncturing their own fingers and inflicting a wound which has continued sore and painful for days together.

Our friend, Dr. C. H. Peabody, whose inventive mind we all recognize, is one of those who has sometimes pierced himself with sorrow and forfeited his amiability under such circumstances, and so has felt himself, as it were, pricked on to contrive an instrument which can hurt only at the right end. He has, therefore, been at work on the invention of a peculiar needle, and has presented us with a number of samples for trial. Well, we like them. They have a peculiar bend, and a sort of double elbow towards the eye, which offers to the surgeon a very good hold and a strong support in pushing the needle through the tough tissue. We have tried them, and can recommend them. There is already something of the same description in use in human surgery, for sewing the skin of the cadaver in post mortems; but we think Dr. Peabody's is of easier use, and therefore answers the purpose better.

Veterinary Department of the Pennsylvania University.—We congratulated the Veterinary Department of the University of Pennsylvania, in our June number, on the valuable grant of which the Legislature of the State had made it the recipient in voting a gift of $50,000. We looked upon this action of the Legislature of the Keystone State as an example which would probably be followed by other States, and as an act by which the days of *private veterinary schools* would be shortened, and, on the whole, as a step which would help largely to bring the cause of veterinary education well forward towards its proper standard. It was, therefore, with much regret that we learned from the July number of the *Journal of Comparative Medicine* the news of the veto by the Governor of the State of this excellent bill, and the loss of the funds by those who would have so judiciously invested them. Great good might have been accomplished with such an amount, and many improvements added to the already well equipped Philadelphia veterinary school. But we hope that, after all, the veto will have no worse effect than the postponement of the benefit, and that it will yet be realized under a wiser Governor.

"Better luck next time" will bring it along. It seems to be a fact that any movement connected with the advancement of veterinary medicine in this country is bound to be slow. It is not to be without drawbacks and disappointments, but it is destined to succeed at last. Yet, although veterinary progress has always been slow, it has in the aggregate been enormous. But whether in Pennsylvania, New York, Massachusetts or Chicago, the work is destined to spread and to rise. The essentials of final success are patience, perseverance, and *honesty of purpose.*

United States Veterinary Medical Association and Review Prize.—We conclude in the present number the paper which was submitted to us in competition for the prize offered by the United States Veterinary Medical Association and the editorial staff of the Review. In accordance with a resolution passed at the last meeting of the Association, every member will receive a special copy of the completed paper. It is hoped that the Committee on Prizes will give it a suitable introduction to the

meeting, and that the members will not prove themselves remiss in respect to their preparation for such action as shall be called for at their hands when the duty of voting upon the merits of the paper shall have been fulfilled. It is a production which has not been prepared without an amount of labor and thought which demand full recognition on the part of the Association.

It is to be regretted that the occasion has not devolved the duty of a larger exercise of critical acumen on the part of the judges, which would have been the case if a larger list of contestants had entered the field.

Report of the English Hydrophobia Committee.—The Hydrophobia Committee appointed by the English Government have unanimously agreed upon a favorable report upon all the questions relating to the subject of Pasteurization in hydrophobia. An abstract of the report of the committee will be found on another page, and we hope to be able to recur to the consideration of the subject in another number. We heartily congratulate the gentlemen of the committee on the wisdom of their conclusions, which they have reached through the most patient and thorough investigation, and for which they are entitled to the highest credit from both the community and the professions which they have so faithfully represented in a most important interest.

ORIGINAL ARTICLES.

MALADIE DU COIT—DOURINE.

By A. Liautard. *

(*Continued from page* 156.)

In stallions the local symptoms are less apparent, and are often local only on the urethral mucous membrane, where the vesicles become ulcerated. They rarely appear on the glans penis or the external parts of the penis; and when they exist, they are accompanied by a limited loss of tissue, and cicatrize quite easily.

* Translated from A. Zundel.

In consequence of this fact, with the ordinarily concealed depth of the local lesions, the diagnosis is rendered more difficult in stallions than in mares, and it is frequently the case that the disease is first diagnosed by the nervous symptoms alone, although these are only of a secondary nature.

The disease is often discovered in pregnant mares before it has been diagnosticated in the stallion, which, when covering the mare while suffering with ulceration of the urethra, is sure to transmit the disease, even while presenting every visible appearance of being in perfect health himself.

It has been said that stallions which are entirely free from any local lesion may communicate the disease; but this is not the case. The impossibility of making a satisfactory examination of the urethra through its entire length renders it a very easy matter for deeply-seated lesions to escape detection, and a simple, local, and perhaps *latent* irritation must have been present, and might be easily overlooked.

The local lesion in the stallion ordinarily consists of an increase of coloration and a tumefaction of the mucous membrane, from the meatus urinarius throughout the entire length of the urethra, with a hypersecretion of mucous. An œdematous tumefaction, together with a contraction of the border of the prepuce, is sometimes observed; the animal has then a *lardaceous sheath.* In some cases the penis is strongly retracted, while in others it hangs out of the sheath and resembles a paraphymosis. The testicles are always flabby and pendant. The act of copulation is performed languidly and with an effort, the ejaculation seems difficult, and the stallion will sometimes mount the mare several times before accomplishing the act. The sperm is more fluid, and the spermatozæ are less active than in health, and these characters become more and more pronounced as the disease progresses. But sometimes, on the other hand, the genital organism and sexual desire seems to be increased, and, in sick stallions especially, there is frequently an involuntary seminal flow. Priapism is very common, the erection of the penis being of a painful character and without evidence of genital desire. In other words, the animal has become impotent. The horses frequently stretch

themselves, as if to micturate, but the act of urination is accompanied with painful efforts, and results in the escape of only a small quantity of urine.

Meanwhile, the appetite is ordinarily good, the coat looks well, the animal has lost but little flesh, and the respiration and circulation are normal. The disease as thus described may be of long continuance, and present the local symptoms alone, its duration being greater in the mare than in the stallion. Yet the venereal desire, and especially the debilitating seminal discharges, constantly tend to hasten the process of the disease. Towards the end of a season, the morbid process seems to subside for a time, but only to return with greater activity at the next. Good care, co-operating with the vigor of the youthful constitution in a young animal, may succeed in limiting the disease to the manifestation of its local symptoms.

The first general symptom observed is the appearance of round tumors over the skin, analogous to those already described in mares. These tumors are flattened, well defined, never confluent, and involve only the dermis proper. They have been wrongly considered to be the first symptoms of the disease. There is often a slight enlargement of the lymphatic glands of the groin, with tumefaction of one or other of the hind legs, and orchitis also is often observed. As in mares, there is a nasal discharge and swelling of the maxillary glands, as in glanders.

Stallions often seem to suffer from a pruritic sensation over various regions of the body. It attacks them with such severity that the animal, in seeking relief, rubs himself so violently as to become covered with bloody ulcerations of an exceedingly ugly aspect, the skin itself being thickened, and tumefied as well. These ulcerations often assume a gangrenous character; the irritation increases, the itching becomes utterly intolerable, and the suffering animal dies in a condition of general marasm.

The nervous symptoms become manifest only towards the last, though they appear at an earlier period in nervous rather than in lymphatic or plethoric animals. The first of these is an excessive sensibility over the loins, which become sensitive to such a degree that the slightest compression over that region may cause the

patient to fall to the ground. The activity diminishes and movement becomes difficult, the portions of the body most affected being the hind quarters; the croup moves laterally, and the members creak during walking; the legs being dragged, and lameness manifesting itself in one or the other leg. In other cases the hocks and fetlocks flex suddenly, the hinder extremities are thrown forward, but with effort, and at times the animal falls to the ground, making no immediate attempt to rise. The symptoms are analagous to those of locomotor ataxia in man, and from this time the loss of flesh becomes more rapid, and the paraplegic symptoms increase, until the animal becomes quite unable to keep his feet.

Then the flanks are retracted, the belly drawn in, the ribs become prominent, the shoulders atrophied, the hips angular and hollowed, and finally bed-sores make their appearance, with complications of arthritis, fractures and ruptures of ligaments as the final accessories of torture and destruction, and the poor beast succumbs to a dismal fate. Paralysis of either one of the ears or of the lips sometimes appears, to complete the disease, while again, still further complications of laminitis, pneumonia, enteritis and purulent infections are not unfrequently added to the incidents and causes of death.

Progress, duration and termination.—The disease is always slow in its course, and appears to possess a chronic character, modified by intermittent symptoms, which are followed by paroxysms.

The duration of the disease is a very variable feature. Recovery may take place, especially in mares, within two months, but, on the other hand, animals may succumb to an attack within the same period, especially if of feeble habit and debilitated constitution.

From six to eight months is the ordinary duration; it seldom lasts beyond that period in mares, although in stallions it may persist for an entire year. Exceptional cases of three, four and five years' duration are recorded.

Recovery by natural process, or from spontaneous causes, is rare, and when it takes place must be attributed to the influence

of therapeutic aids. Haubner admits that the average mortality is 40 per cent., but may sometimes reach 70 per cent. It is mortal in males oftener than in females. Convalescence is often long protracted; recovery is often more apparent than real, and relapses are common, especially under the influence of genital excitation. The disease may recidivate.

(*To be continued.*)

GLANDERS.

By Veterinarius.

A Contribution for the Prize offered by the U. S. Veterinary Medical Association for Papers published in the American Veterinary Review.

(*Continued from page* 163.)

The Differential Patho-Anatomical Diagnosis in Glanders.

This most important subject was very ably defined by Professor Schutz in his instructions to the Chief Veterinary Police Officers of Germany.

Prof. Schutz states that glanders finds its origin in a contagious principle.

The specific product in glanders is a small nodulus about the size of a millet seed, composed largely of round cells, and more or less stroma of connective tissue. These noduli must, therefore, be classed among the connective or granulation neoplasms. This tissue is soft, and contains more or less fluid in its meshes, and is of a yellowish-white color. The richer such neoplasms are in cellular elements, the more clouded do they appear.

The fresh nodulus in glanders is gray in color, and consists of small round cells; the older ones are of a yellowish color, and contain large cellular elements. These nodular neoplasms undergo necrobiotic degeneration, frequently leading to the formation of cavities when situated in the midst of parenchymatous organs; when situated superficially, as in the nasal mucosæ or in the skin, such degeneration leads to the formation of ulcers. When fatty metamorphosis occurs in these noduli, they assume a clouded yellow color, which has frequently led to said noduli being looked upon as (genuine) tubercles.

Many pulmonary diseases of the horse are characterized by the presence of circumscribed productions of the most variable character and form, and veterinarians frequently designate every variety of nodulus met with in the lungs as tubercle. Even in the present day we often find glanders noduli mistaken for genuine tubercles. Even though the products in tuberculosis resemble those of glanders, still, from an etiological point of view, they vary essentially from one another. It must also be borne in mind that genuine tuberculosis is an exceedingly rare disease in the horse, and that the fresh tubercle is pearly and transparent, the older opaque and whitish, while the nodulus of glanders is, when fresh, gray, but later on yellow, and finally bears a strong resemblance to small abscesses. A glanders nodulus resembles tubercle in that they frequently form nests or conglomerate masses, and break down, especially when superficially situated, as in a mucosa.

It is incorrect to compare the ulceration of a glanders nodulus to the bursting of an abscess. When an abscess comes to development, the tissues are destroyed, in place of which a cavity is formed, filled with pus, which finally bursts, leaving a distinct interruption in the continuity of the tissues involved; on the contrary, a glanders nodulus undergoes a gradual process of ulcerative destruction, the material which escapes being the detritus or remnants of destroyed tissues. This softening or ulcerative degeneration does not at once complicate the entire nodulus; the base and circumference of the neoplasm are the seat of neoplastic granulations, presenting a lardaceous appearance. Such an ulcerated nodulus gradually cleans itself of its necrobiotic elements, leaving nothing but a superficial ulceration having a peculiar form, which has given to it the name of "lenticular ulcer."

These lenticular ulcers have frequently been described as erosions, which is entirely wrong. An erosion is the removal of the epithelial covering from underlying tissues. In lenticular ulcerations, not only the epithelium, but a portion of the tissue under it, undergo necrobiotic destruction.

The development of glanderous nodules, and the progressive process of ulcerative destruction which it undergoes, can be observed best in the nasal mucosa. In a short time, in the circum-

ference or deeper-seated tissues of a glanderous nodule, at some distance from it, a new nodulus and ulcer develops, by coalescence and sequentral extension of the ulcerative processes, ulcerated surfaces develop of variable extent and form, and are known as secondary ulcers. The latter are characterized by their swollen, irregular edges and uneven base, and the presence of newly developed small noduli that have not yet undergone destruction. This indicates that the primary nodulus, or ulceration, exerts an irritative action upon the adjoining tissues, causing similar disturbances in them, and indicates that the contagious elements of glanders proliferate in the primary noduli and penetrate the adjoining tissues by means of the capillary circulation. The secondary processes can also appear at a distance from the primary. This extension of the pathological processes is especially frequent in the respiratory tract. They can extend to the inferior part of the nasal cavities or the sinusæ of the head, the œsophagus, larynx, trachea, bronchial tubes, or even the lungs. The ulcerations may be either superficial or profound, according to their situation in the tissues; but scarcely any tissue is free from them. They often extend to the perichondrium in the nasal septum, or the valvular covering of the Eustachian tubes, or the cartilages of the larynx, tracheæ and bronchial tubes, and to the periosteum and underlying osseous tissues in appropriate localities, causing necrobrosis in all such parts. Perforation of the septum nasi is not infrequent, or cicatricial contractions and deformations occur in other parts of the respiratory tract.

The processes of glanders in the mucosæ are often connected with simple inflammatory disturbances in their vicinity. The noduli and ulcers are frequently surrounded with a nucleus of injected blood-vessels, which renders their recognition easier than it would otherwise be. In most cases the adjoining mucosa is in a more or less catarrhal condition, swollen, and secreting an aqueous, purulent or hæmorrhagic mass.

The quantity and nature of the secretion in glandered horses is decided by the seat and extent of the catarrhal irritation, more than the ulcerative processes in the anterior portion of the respiratory tract. The bronchial mucosa is frequently the seat of such

excessive irritation that their lumena are completely filled with a muco-purulent mass. The catarrhal products often extend from the nasal cavities to the frontal and lateral sinuses of the head, filling them with a more or less dense secretion of a similar character. The catarrhal products can also extend through the Eustachian tubes to the guttural pouches. When the irritation is very violent, the secretions acquire a hæmorrhagic character. These secondary inflammations often complicate the deeper-seated tissues. The mucosa, and also the submucosa of the nasal cavities, become intensely swollen and œdematous. In the larynx such processes often cause "œdema glottidis."

When the infiltrative processes have reached a certain depth in the tissues, a purulent perichondritis is often found in the septum nasi and larynx, frequently leading to necrosis and perforation, or to serious cicatricial retractions.

The ulcerations in the glands, either primary or secondary, often heal by cicatrization. These cicatrices have a more or less stellate form. When the ulcerative processes extend equally in all directions from a primary nodulus, the healing commences in the center, while the neoplastic and ulcerative processes extend at the peripheries. These large ulcerations also heal by the granulations, and are frequently the seat of more or less extensive hæmorrhages. This cicatrization does not always occur in a harmless manner; all sorts of malformations in the complicated parts may occur—even the utter destruction of diseased tubes or cavities. Definite healing seldom results, for new noduli and ulcers frequently develop under the cicatricial tissue or in its circumference; similar processes also develop within the cicatrices, giving the impression that the latter were also the object of denteropathic invasion—hence cicatrization is not always the termination in glanders, but simply a part of the same.

The processes in the skin, as well as the mucosa, are generally accompanied by complications of the lymphatic system, which are of a secondary nature aud bear direct connection with those parts from which the glands receive their lymph. The contagious principle is taken up by the lymphatics in and around the primary diseased localities and conveyed to the first lymph-glands in their

course, and from these the irritans is conveyed over the system. When the disturbances in the septum nasi are limited to one side, the submaxillary, pharyngeal, and other lymphatics upon that side only, become diseased. The same occurs when glanders complications begin on one or the other extremities. The diseased glands become hypertrophied, and upon section present a refracting surface of a reddish or gray color. Later on, they become drier and the cut surface not so smooth, and contain white spots or striæ which correspond to the swollen follicles or thickened interfollicular tissue; in acute glanders, when the irritans is severe, more or less hæmorrhages are present. This is the first or simple hyperplastic stage; later on, the glands become more dense, and the cut surface is of a red-white color; the gland seems to be composed of medullary tissue. This stage is known as that of "medullary hyperplasia." In neither of these stages does the cellular hyperplasia attain the degree of development frequently occurring under other irritative conditions of the nasal mucosa, accompanied by complications of the neighboring lymph-glands. In glanders these glands seldom become larger than a walnut, and the individual lobules of the gland become flattened by mutual pressure, but do not adhere; at this period the capsule of the gland is generally unchanged.

In the living animal one can frequently notice that the glands are somewhat painful on pressure. If the glanders processes in the skin and nose heal, the supply of irritating material is shut off from the lymphatics, and the glands again become smaller, though not assuming their original size. This does not generally occur, for in most cases the disease is characterized by extension, though healing in the primarily affected parts is frequent. The enlarged condition of the glands can increase through the development of neoplastic elements in the interstitial tissue or stroma of the same, by which they become intensely hard and indurated. These processes extend to the capsule and periadenon tissue, frequently causing their attachment to the overlying skin or adjoining parts.

The earliest changes which are capable of macroscopical demonstration in the glands are small circumscribed spots of a grayish-

yellow color, which occur in nests or are disseminated over the gland, and occur either in the medullary or cortical portion of the gland. The other parts of the gland are in a condition of cellular hyperplasia of a simple irritative character. The yellow spots become larger, and undergo purulent degeneration or desiccation (necrobiosis), forming caseous conglomerates or noduli. These abscesses or conglomerates frequently occur in the midst of a hypertrophied gland. The specific irritant having gained access to the gland, causes the development of chronic, indurative conditions.

Glanders being a specific disease, the pathological disturbances must be divided into (1) primary or specific, and (2) secondary or simple inflammatory processes. The one class may be compared to those which follow any form of irritation; the other, on the contrary, possess peculiarities which are specific to glanders.

In glanders the entire gland is seldom found complicated; as a rule, single parts or lobuli of the glands are more affected than others.

Suppurative processes in or around lymph-glands, which finally escape outwards, are very rare in glanders. Simple suppurative inflammatory processes can, on healing, leave the glands in a condition resembling that of glanders. The contents of such abscesses can desiccate and become cheesy, or peri-œdnoid indurations may occur by which the glands become hard and more or less attached to surrounding structures.

When in specific disease of lymph-glands in glanders, other centers of disease occur, and a viscid, purulent mass forms the contents of the gland, and the cells undergo disintegration, leaving a fatty detritus; the cavities being filled with a soft mass of fat granules, and the noduli do not become completely caseated, but acquire a soft, yellowish center—these are valuable points for differential diagnosis. If doubts still remain, they can be removed by giving special attention to the condition at the primary seats of disease, or by microscopic examination of the contents of the noduli.

Lymph-glands in a condition of simple hypertrophy frequently undergo a mild form of fatty metamorphosis. A cross-section of

the same appears studded with yellowish-white points or striæ, while the remaining parts of the gland are in a gray, hyperplastic condition, also composed of fatty detritus. If the glands are gray or blackish in color, and indurated, which is often the case with the bronchial lymph-glands, the cross-section presents a variegated appearance.

Calcareous noduli, of various dimensions and shapes, surrounded by a firm capsule, are often found in lymph-glands, especially those in the vicinity of the bronchials. These noduli can be easily removed, leaving their cavities or surroundings distinctly visible; on cross-section they present a lamellated structure. It is not always possible to give a decision as to the primary nature of these noduli—that is, whether they are of entozoöic origin. Many veterinarians have ascribed to them an etiological connection with glanders, without sufficient reason. Why the noduli of glanders should become calcified in this isolated manner cannot be explained. On the other hand, it is probable that noduli which are not so easily removed, and which have no striated structure, are connected with glanders. But as the calcification of glanders nodules in these organs has by no means been proven, these objects must at present be looked upon as of an etiologically doubtful origin. Large calcified masses occupying distinct sections of a gland must be considered as a metamorphosis occurring in retained purulent material. Glanders noduli undergo dissolution in course of time, and are transformed into a mass of detritus capable of absorption. This mass is taken up by the circulation as well as the lymphatics; in the former case they cause direct pollution (infection) of the blood—glanders dyscrasis; the latter has been partially proven experimentally, by injecting blood from horses affected with glanders into healthy ones; and the same fact is also proven by the appearance of metastatic processes in distant parts of the organism of the same animal.

In glanders the lungs are generally the seat of such processes; therefore the necroscopist must carefully distinguish between primary and secondary processes in this disease. Secondary pulmonary glanders is a very common occurrence. It is evident that when a glanders dyscrasis occurs, secondary pulmonary processes

develop in other organs, such as the liver, kidneys, heart, and also in muscles, bones, etc. Such a dyscrasis is by no means a permanent condition, as, when infectious elements gain access to the blood, they must soon be removed by natural processes, from the fact that they find a resting place in certain tissues or organs, where they develop metastatic centres or pass away with the secretions, urine, etc. The latter was confirmed by numerous experiments. If the disease continues in certain parts, it is self-evident that the tendency to metastatic processes must also continue. Processes in the anterior respiratory passages and skin often heal, and the lymph-glands undergo a retrograde metamorphosis and retract, and that the secondary metastatic processes are only observed after the lapse of a considerable time. This period is often spoken of as "latent glanders"—that is, the disease is present in invisible organs—pulmonary glanders. If a horse should be killed at this time, no striking pathological changes except those in the lungs are found; slight changes in the anterior respiratory organs often heal without leaving an easily recognized cicatrix, and the tumefactions in the lymph-glands disappear quite as often, especially when the inflammatory processes are of a non-specific character. Such cases have led to the mistaken assumption of the existence of primary pulmonary glanders. It is also well known that this latent or hidden form of glanders often gives rise to secondary infection, the development of new local centers, and a suspicious pneumonia, which render the disease again open to occult demonstration. Such cases may possibly have led to the assumption of the spontaneous origin of glanders.

The specific glanders noduli in the lungs always appear in numbers, never as single phenomena; at first they are of a gray color, and moist, but later they become yellow, and dry in character. They either lie subpleural, so that they can be seen through the same, or in the substance of the lungs; they develop in the stroma or interstitial tissue of these organs. The fresh noduli are surrounded by an irregular zone of inflamed parenchymatous tissue, the circumferences of which are not sharply defined. These zones are hyperæmic, moist, atalectatic, and present a smooth surface or section, though they are sometimes granulated

fibrinous pneumonia. The nodules are separated from the pneumonic surrounding by a ring of red tissue. In passing the fingers over such a lung, one can not only feel the noduli specific to glanders, but also the pneumonic centers surrounding them. The number of noduli present varies; in some lungs they are present in thousands, sometimes disseminated, sometimes in nests so thick together that the infiltrated pneumonic centers coalesce, and large sections of the lungs are transformed into a dense and atalectetic mass. The noduli and their surroundings soon undergo certain changes. The gray noduli become opaque and yellow, surrounded by a transparent gray and vascular tissue, which can be traced to its connection with the interlobular tissue and the septa of the alveoli.

These yellow centers are slightly caseous, but do not present a thoroughly desiccated appearance; their circumferences are irregular, and interrupted by the extension of processes of a like character into the fibrous surroundings; so that these noduli cannot be removed, even with a knife, without tearing the tissue in which they are situated. When a confluence of a large number of noduli takes place, large sections of the lungs are transformed into masses of grayish-white indurated tissue, enclosing necrobiotic noduli in their midst; upon section, these noduli appear as small yellow centers, surrounded by a sort of capsule with irregularly marked outlines. At other times these centers are of a purulent character, surrounded by infiltrated pulmonary tissue, which is often complicated by softening disturbances that began in the specific product of glanders, giving rise to the formation of cavities of variable size and form, filled with a purulent or soft-like mass. New eruptions may be seen in the vicinity of these centers, which are valuable in recognizing the specific nature of the disturbance. At other times disintegrated masses are found surrounded by a pale gray layer of fibrous tissue forming a sort of capsule; cross-section reveals the existence of cavities and canals, filled with purulent and necrotic material. The ulcerative processes frequently lead to the erosion of blood vessels and sequential hæmorrhages; the latter are, however, often prevented by the formation of thrombi in the vessels—a very common occurrence in the lungs

in glanders. Small embolic centers may be mistaken for freshly developed glanders noduli, varying in size, and filled with a yellowish mass, surrounded by a hyperæmic ambus of a dark red color, having a smooth surface on section.

Hyperæmic tissue surrounding glanders noduli is never black-red, and not so extensive, and does not contain so much fluid blood as the hæmorrhagic. Acute broncho-pneumonia centers may also be mistaken for those peculiar to glanders; the same are small isolated complications, or they may be seen in groups, and of a red or reddish-gray color, projecting somewhat above the cut surface of the lung; the bronchial tube appears as a small yellowish point in the midst of pneumonic infiltration; by pouring water gently upon such points, one can easily demonstrate the presence of the bronchial tube, which will appear as a small, round hole when you have washed out the mass with which it was filled. Ordinary pneumonia centers that have undergone a form of gangrenous dissolution, have been mistaken for those of glanders.

Pneumonia in the horse often occurs in a multiple form—*i. e.*, numerous inflammatory centers distributed over the substance of the lungs; they are at first hyperæmic and glancing, but later on become dry, anæmic, and of a yellowish-white color. Necrobiosis of the pulmonary tissue frequently occurs, leading to the development of a sort of sequestor, or a mass of broken-down tissue enclosed in a sort of capsule, which marks the line of demarkation from still healthy tissue. It is in this way that the so-called abscesses in the lungs are formed. Fresh ones are surrounded by intact or infiltrated lung tissue, while older ones are surrounded by a sort of capsule of indurated tissue. The bronchial lymph-glands are at the same time in a condition of cellular or fibrous hyperplasia. The fresher these conditions, the more easily can they be distinguished from others, because one cannot find the gray or yellowish noduli of glanders in the lungs at such times. The differential diagnosis is, however, possible later on, because it seldom happens in glanders that one finds either single or several infiltrated lobuli separated, as it were, by these gangrenous processes in the direction of the interlobular striæ of connective tissue, while such is the rule in pneumonia. Further: the necrotic

tissues in pneumonia which were previously very full of blood, do not give up their color as in glanders, but retain a very marked yellowish-red color. Finally, one must always have recourse to a critical study of the conditions of other organs. The frequent appearance of calcified noduli of a size corresponding to those of glanders, has often led to mistaken conclusions. They are generally round, with sharply defined limits, and enclosed in a very delicate, transparent capsule of connective tissue, from which they can easily be removed. The inner surface of this capsule is perfectly smooth. It has never been possible to find any adhesions between these objects and the bronchial tubes; cross-section of these calcified noduli shows a striated structure; they are often distributed over the lungs in great numbers, as well as in the bronchial glands, but less frequently in the submaxillaries; they seem to have a special predilection for the liver. *These things have no connection with glanders.*

Bronchitic, peri-bronchitic and broncho-static noduli have been frequently mistaken for those of glanders of an old date. It is natural that this error should occur when the extension which the idea of primary pulmonary glanders has attained among veterinarians is taken into consideration.

These bronchial noduli are the product of chronic inflammatory processes in the parietes of the bronchials; some develop in the lumen of the tube, causing obstruction—bronchitis proliferans; in other cases, besides thickening of the walls of the tube, a purulent fluid is secreted, causing distension of the tube—bronchitis chronica catarrhalis. When the irritative processes extend to the tissues surrounding the tubes, a peri-bronchitis is the result, causing the development of connective tissue and apparent thickening of the walls of the air tubes. The puruleut mass frequently accumulates and becomes caseous—bronchitis caseosus—causing complete obstruction; at other times this mass calcifies, and the lime-like material is enclosed by the bronchial wall. These irritative processes generally occur in and around bronchial tubes of the smallest calibre; they may be quite extensive, or more or less sharply circumscribed; in the latter case the tubes look as if studded with small noduli throughout their extent—bronchitis and

peri-bronchitis nodoso. They present themselves as small bodies, about the size of a millet seed; they are often numerous, but at other times occur only here and there. In the case of bronchitis proliferans, these noduli have a gray color, and upon section the lumen of the tube can often be seen. In bronchitis catarrhalis and caseosa, the centers of the nodules are filled with purulent or caseous material, surrounded by pearly-gray tissue, so that what was apparently a nodulus is, in reality, nothing but the cross-section of an indurated bronchial tube. When the caseous material filling the bronchials at such a point becomes calcified, a small kernel of lime is found in the center of such a nodulus, and is easily removed.

Bronchostasis is a progressive process by which the lumen of a tube becomes greater, and in the horse occurs most frequently in the smaller tubes (it can also occur in the large tubes) of the anterior and lower, or central lobes, of the lungs; they generally occur in multiple form, seldom isolated. According to the thickness of the wall of the tube, they can be classified as: (1) Atrophy, and (2) Hypertrophy; according to form, as: (1) Cylindrical, (2) Sacculated, and (3) Serpentine, etc. In every case of bronchostasis, bronchitis in one form or another is present. Outside of them, pneumonia processes frequently come to development. The circumscribed or sacculated form often appears as noduli, about the size of a pea, but cross-section soon reveals their true nature.

It should be impossible to mistake any of these conditions for the specific one of glanders, though one or all of them may appear in the same lung at the same time as those of glanders, or when there is no evidence of glanders. In fact, they are not uncommon in old horses in all varieties and degrees of development.

In all glanders noduli, the purulent or caseous mass in the center is always in immediate relation with pulmonary tissue; in these bronchial conditions, never—the bronchial wall invariably forming a line of demarkation. In the latter, the contents can always be removed, leaving the wall intact; in glanders, never. Another fact of diagnostic value is, that the noduli of glanders are seldom of the same age; besides old and anæmic, fresh ones are also present. Again: as a rule, the noduli in glanders are of metastatic origin, and in doubtful cases the exact examination of

other parts of the respiratory tract, as well as body, will certainly lead to a safe conclusion. Finally, it is necessary to mention those chronic inflammatory or indurative processes in the lungs which generally find their origin in a chronic pleuritis or bronchitis, or begin directly in the perialveolar tissue. Such processes frequently lead to the development of circumscribed centers of a more or less nodular character, but of variable size, some as large as a hen's egg; they frequently occur close to one another, or coalesce and form large, irregular, circumscribed and indurated masses in the lungs; they are very common in the anterior and middle lobes, and on cross-section give manifest resistance to the knife, being dense and hard, and present a white or gray color. If such changes are in the vicinity of the pleura, the latter becomes thickened, white and opaque; adhesions between the pleuræ are then frequent.

Obstruction of the lumen generally follows chronic processes in or around the bronchial tubes; the same leads to atalectatic conditions of the parts supplied with air by the obstructed bronchials. In anæmic animals, such sections of the lungs are pale in color. If the atalectasis is of long duration, then atrophy of the pulmonary tissue results. These changes occur principally in the anterior lobes and in the lower and middle portions of the lungs. When these atalectatic or atrophied portions of lungs become the seat of chronic pneumonic processes, they remain small, soft and anæmic. It is evident that both conditions can be present at the same time.

It is no uncommon occurrence to find that ulcerative (destructive) processes have originated in the distended portion of bronchial tubes, finally causing perforation of the wall and pneumonic disturbances of both an ulcerative and indurative character. As the progress of the same can be traced, they need not be mistaken for glanderous disturbances.

It is, therefore, plain that it is necessary to distinguish quite sharply between the specific productions in the lungs that are peculiar to glanders and due to its specific cause, and those secondary complications which, while frequently due to the action of the same cause, may either antedate the development of the specific products, or even occur entirely without their ever happening.

AMERICAN VETERINARY COLLEGE.

HOSPITAL DEPARTMENT.

HÆMORRHAGE AND SEPTICÆMIA AS COMPLICATIONS OF CASTRATION.

By Julius Huelsen, Jr., D.V.S., House Surgeon.

In considering the complications of castration, prolonged hæmorrhage and septicæmia are perhaps not as common as others, and the following peculiar case is therefore worthy of notice:

A valuable sorrel racing colt, four years of age, 15½ hands high, was cast for operation at 8 o'clock A.M., June 7, 1887, after due preparation as to feeding and administration of anæsthetic in the shape of ʒ vii. chlor. hydr. The method of operation was that of limited torsion, the instruments employed being those of twisting forceps, which have had frequent successful use at the hospital. The posterior septum of the cord with the efferent canal and small testicular artery were first divided by scalpel, as usual, and the cord then amputated without any more than the ordinary struggles of the animal, after about fifteen turns of the torsion forceps.

In this case, however, the twisting of the artery seemed to have had no effect, for hæmorrhage in a small stream at once commenced from the right side; but as this must soon naturally close by coagulation, there was no occasion for alarm, and the patient was placed in the stall for observation.

At 10 o'clock A.M. blood was still noticed to flow, in a quick succession of drops, and a cold-water douche was applied for a time to the parts until there was an apparent stoppage, but only temporarily, and the cold water showers were continued during the day four or five times.

A pad of oakum, saturated with a weak solution of tinct. of chlor. of iron, was applied in the evening externally to the sheath; then, later, a packing of ice, supported by a bandage. Recourse was then had to tents of oakum saturated with the solution of iron, introduced into the wound (secured by suture), which was found almost filled with clot; but all of no avail.

The blood, on examination, was found normal in color, and coagulated freely. What was the cause of this obstinate hæmorrhage could only be surmised. Was this method of castration by the process of torsion to be blamed—the coats of the artery not being properly twisted? but, even in this case, the flow should cease by natural coagulation with the agents used as hæmostatics; or was there a diseased condition of the artery, a want of elasticity, that prevented coagulation taking effect? or again, might it not be one of those peculiar cases of hæmorrhagic diathesis met with sometimes in human subjects?

June 8th.—Although there was no actual cause for alarm, the hæmorrhage being only in drops, about sixty per minute, the patient was placed under observation all last night, and early this morning more radical measures were attempted. The animal was thrown, the tent of oakum and a clot of blood quite as large as a child's head, removed, and efforts made with a pair of long forceps to find and pick up the artery for the purpose of ligating, but this was found so far withdrawn in the canal that attempts were abandoned. The cavity was then filled with four large surgical sponges and two tents of oakum, secured by suture across the edges of the wound, and the animal placed in a box stall. During the rest of the day, ice packings were placed around the sheath, alternated with douches of ice water; but the steady flow, drop by drop, continued all day, especially noticeable when the animal moved or the parts were disturbed. The sheath now showed some swelling. Temperature during the day, 98.3°; pulse, 55; respiration somewhat accelerated; appetite good. The left wound seems all right.

June 9th.—Cold water douches were continued at intervals of one hour each, all day, until the hæmorrhage, which in the morning oozed about 20 or 30 drops per minute, ceased altogether at 4 o'clock P. M. Carbolic acid injections were used thereafter. Appetite fallen off somewhat, though eating clover with relish. Temperature, 102°; pulse and respiration same as yesterday.

June 10th.—This morning the sponges and oakum and a little clot, broken down and of very bad odor, were removed. Wound washed with ice-water stream and injection of carbolic solution

every two hours until 6 o'clock P.M., when, with the carbolic solution, bichloride of mercury (one part to a thousand) was also injected. Considerable bad-smelling pus, sanious discharge, at each injection. The sheath is now considerably œdematous, though no more than usually follows castration by torsion. Temperature, 8 A.M., 102.1°; pulse, 60; respiration a little quickened. 12 M., 103.2°; 6 P.M., 103.3°. Left wound is doing well.

June 11th to June 21st.—A new complication began now, making itself more and more discernible, and of much graver import, than the hæmorrhage. Septicæmia was apprehended, and undoubtedly present, though not as yet of much progress, and prompt measures were necessary. That there was gangrene of the tissues in the right wound, the cause of which could not be exactly ascertained, was evidenced by the unhealthy, sanious, bad-odored discharge, and the system was undoubtedly under the influence of its poisonous effects. Symptoms of general disturbance are plainly visible—remittent fever, generally high in the morning and evening, about 103° to 104°, and lower at noon, about 101° to 102°. Pulse has been varying from 60 to 80 beats, wonderfully full and strong. Daily, about noon, perspires freely. From a slight bruise an abscess developed over the left eyelid, which opened itself, on the 15th, with a discharge of sanious pus, similar to that from the scrotum. Also on the off hind leg, metatarsal region, another abscess with similar discharge, caused by pressure of bandage. An abscess also opened at lower part of sheath. The œdema of the scrotum is decreasing, but the penis became quite largely swollen from the long-maintained standing position; but this soon reduced to its normal size by proper supporting truss.

During this time, remedial treatment has been actively pursued in the shape of antiseptics. Strong solution of carbolic acid and bichloride of mercury were injected every two hours into the wound. ℥ ii. doses of quinine, administered four times per day, and ℥ iv. dil. alcohol three times per day, in drinking water.

However, favorable symptoms are not wanting. The patient has maintained a good appetite, though at first more for clover than oats or hay; at first dull, seems brighter now, and responds

readily to manipulation over the loins. The discharge, too, within the last three or four days, is assuming a less ugly appearance and bad odor, and decreasing day by day. The temperature has decreased, and on June 19th was normal. Pulse, 48; respiration, 20, and has continued so to date.

June 20th to July 1st.—The wounds are discharging a much healthier pus, and gradually decreasing. Appetite the same, or even increasing. Still perspiring at certain times of the day. The same injections have been continued, though less frequently. Quinine twice a day, but ceased on June 26th. Commencing now to give walking exercise, about half an hour per day. Temperature, pulse and respiration normal. Wounds on near hind leg showing healthy granulations, and closing, and that of left eyelid all healed; œdema of sheath and penis all disappeared. Now administering only alcohol.

July 3d to July 5th.—From some unknown cause, temperature on the 3d rose to 103°; pulse, 55; respiration, 20; mucous membrane yellowish; constipation and loss of appetite, with slight colicky pains. Febrile symptoms, however, disappeared by administration of quinine and alcohol, with rectal injection, and now functions are again normal.

July 12th.—Discharged, to go for a time to pasture.

REPORTS OF CASES.

EXTRACTS FROM NOTE BOOKS.

By L. C. Wakefield, D.V.S.

SERIOUS FOOT INJURY, WITH NECROSIS OF THE OS PEDIS.

Case No. 1.—May 5th I was called to see a bay mare which had been used in a horse-power. The history of the case was: Three weeks before my visit the mare, while working in the machine, caught the shoe of her right hind foot in one of the logs, with sufficient force to stop the machine and throw her out of the power. Immediately after the accident she manifested some pain in the injured foot, but on having a rest of a couple of

weeks, she got better, and was put to work, and on the following day she could hardly put her foot to the ground; and when I was first called, she was suffering intense pain, and there was a very fœtid ichorous discharge issuing from the coronet at the heel and around the frog.

I ordered the foot to be soaked well in warm water, and the next day I visited her for the purpose of removing the diseased horns. I first removed the sole and horny frog, and then, by probing, I found it necessary to remove the wall, which I did by sawing through the horn just below the coronet, and tearing the wall off with a pair of pincers. The resulting hæmorrhage was soon stopped with Mousell's solution. After the removal of the horn I found the plantar cushion was gangrenous, so as to necessitate a removal of its surface. The keratogenous membrane, from the point of the plantar cushion extending over the anterior part of the plantar surface and the anterior border of the os pedis, was also gangrenous, so as to necessitate removal. The unhealthy tissue under the diseased membrane was cauterized with argenti nitras, and two exposed places on the os pedis were scraped. During the operation the foot was well irrigated with a one-tenth per cent. solution of bichloride of mercury. After the operation the animal was placed in slings, and the foot was dressed daily with antiseptic cotton and a 3 per cent. solution of phenic acid. The gap in the keratogenous membrane closed very slowly, and just two months from the date of the operation it was entirely closed. In the meanwhile the wall grew very fast, so that now the lower border at the toe is within three-quarters of an inch of the sole, and the latter is thick enough, so that the injured foot bears its share of the animal's weight.

A LARGE VENTRAL HERNIA.

Case No. 2.—A gray gelding, five years old, was let loose in a yard with some cows, and got hooked at a point below the right flank, about eight inches from the linea alba, and about five inches posterior to the border of the asternal ribs.

The owner first discovered an abrasion of the skin and a soft tumor about the size of a hen's egg. Some time after the injury

the owner applied compresses and truss, but on their removal the tumor seemed to increase in size. The horse was brought to me, and I diagnosed the case as one of ventral hernia, which I found was easily reducable, and also that it lay under a thick portion of the panniculus.

The owner requested me to operate on the hernia, which I did May 11th. The horse was cast on his left side, and the operation was performed without the use of a twitch or anæsthesia. The rent that gave rise to the hernia was nearly vertical; consequently I made a vertical incision through the skin, about three inches long, just forward of the rent. I then dissected the skin from the panniculus, about two inches posterior to the rent; then incising the panniculus, a portion was dissected back from over the hernia; this exposed the rent. I replaced the protruding bowel with the middle finger, and took three sutures with catgut, which closed a rent nearly one and a-half inches in length. I could easily feel the balls of fœcal matter in the bowel, and in applying the sutures I took pains not to injure the peritoneum, but get a firm hold in the edges of the tunica abdominalis. The pannicula was then brought together with catgut sutures, and then the skin was brought over the whole and sutured with silk. A felt compress was then placed on the wound, so as to allow the pus to escape, and was held in place by an elastic truss. The animal was allowed to get up, and was placed in a roomy box. The first week he was kept on a scanty and laxative diet. There were no complications; the wound suppurated well, was washed daily with a weak solution of phenic acid, and at the end of five weeks the wound had entirely healed, with no appearance of the hernia. The horse now takes light exercise in the harness.

LIPOMA ON THE CHEST.

Case No. 3.—A bay gelding, ten years old, was brought to me, with a large tumor just back of the ulna, on the left side of the thorax.

The owner gave the following history: When the animal was two years old he noticed a small bunch back of the ulna, and this bunch had gradually grown until it was about as large as a man's head.

A year ago the owner employed an army surgeon to remove the tumor. The horse was prepared for the operation, but on a close examination the surgeon concluded it would be risky to undertake the operation, and refused to do it, from the fact of the subcutaneous thoracic vein lying directly over the center of the tumor.

Upon examining the tumor I found that it lay under the panniculus, and diagnosed it as a lipoma.

The owner wished it extirpated, and I undertook the operation June 11th. I first injected a 20 per cent. solution of cocaine into the panniculus. I then cast the animal on the right side, first making a bold incision, about thirteen inches long, down to the tumor, just above and parallel to the vein, and then making an incision perpendicular to the first incision and beginning at about its center and extending to the upper border of the tumor, a distance of about six and one-half inches. I lacerated the fibrous bands that attached the tumor to the surrounding muscles and tissues, and brought the lower half of the tumor out from beneath the vein and panniculus. I then found it was still fastened to one of the ribs by a strong pedicle, two inches in diameter; this I severed with an écraseur. The tumor weighed nearly ten pounds, and proved to be a lipoma. The wound healed rapidly, and at the end of five weeks it entirely healed, leaving a very small cicatrix.

PUNCTURED WOUND OF THE RECTUM—DEATH.

By C. Peabody, D.V.S.

Without entering into full daily details of this case, and merely referring to the treatment used as a means to make the patient comfortable, I wish to record it as an illustration of the difficulty of making a diagnosis when the history of a case is incomplete.

April 25th I was called by my friend, Mr. R., a practitioner in a neighboring city, to see with him an animal belonging to one of the departments of that city.

On inquiry by telephone, I was informed that the animal had a sore throat, with inability to swallow; that impaction of the large colon had followed, and that he now had pneumonia.

On seeing my patient, at 10 P.M., the previous history was repeated to me, and I found that a good blister had been applied to the throat, that the animal was standing with his nose stretched forward, his eyes staring, nostrils dilated, very short, increased respiration (80), pulse about 110, temperature 107°. The animal could drink, and had eaten some oats and hay during the day. The increased respiration began only in the morning, and at 6.30 P.M. the temperature was only 102°. Exploration of the thoracic cavity failing to disclose any disease in that region, I carefully inquired if the animal had received any injury, but was answered in the negative. I then examined him per rectum, to discover the condition of the bladder. This I found empty. The rectum was very dry and warm. I was only then informed that injections of warm water and soap had been given. These I directed to be stopped, as I saw no indications for them. The animal had had a severe chill about two hours before my seeing him.

Being unable to decide as to the cause of the existing disturbances, and thinking that the true nature of the disease was not yet entirely developed, I decided to make the animal as comfortable as possible, and to treat the symptoms of the case as they presented themselves. I therefore prescribed quinine and whiskey, with directions to allow him to drink water frequently, as the animal appeared very thirsty.

The next morning I was informed by telephone that the animal appeared much better. His pulse had fallen to 60, the respiration to 40, and the temperature to 103°. I saw him at 5 P.M., and found that the pulse had risen to 70, respiration 42, and the thermometer registered $104\frac{3}{5}°$. The general appearances were very similar to those of the previous day. The mucous membranes were highly congested; the animal moved quite stiffly behind; the throat was swollen; when attempting to micturate, he stretched out and pawed, and then passed but very little urine. His bowels had not moved since the night before. The lungs, when examined again, were found healthy, but pressure on the

abdominal walls gave pain, and more especially on the off side, and well up in the flank. Another inquiry as to the possibility of the animal having received local injury, was answered in the negative.

I proceeded then to make another rectal examination, which proved to be very painful to the animal. The rectum was empty and dry, and when the hand was introduced the respiration became rapidly increased. Pushing my arm well into the rectum, I at last found the cause of the trouble.

Before removing my arm from the rectum, I inquired what kind of syringe had been used in giving him the injections, and was shown a metallic instrument that would hold about a quart of fluid, with a nozzle twelve inches long. I found also that the last injection had been given at 7.15 P.M. the day before, and that it was about 7.30 when the hurried respiration was observed. "The last injection was well kept," said the assistant. Of course it was!

The trouble proved to be a large hole a little to the right of the median line of the rectum, leading directly into the abdominal cavity. The four fingers of my hand were readily introduced through this opening, and the intestines were easily felt. The laceration occurred about fourteen inches from the anus.

Diagnosis made at last; the prognosis was unfavorable.

The animal at this time was quite uneasy, amd showed considerable pain, but was readily quieted by a full dose of chloral.

From this period to the time of his death, the animal showed variations in the pulse between 48 and 60; respiration from 16 to 52, and temperature from 101° to 104°. At times he would eat a few pieces of carrots, some grass, sloppy food, etc. When the rectum became full, he would press his buttocks against the partition of the stall. On removing the fœces from the rectum, he would become easier. At times he would have diarrhœa. On the fifth day after the injury a swelling appeared in the inguinal region of the off side, and continued to increase until death. On the 3d of May, eight days after receiving the injury, he had cold sweats on both

flanks over a space about eight inches wide. On the twelfth day he discharged with the urine a thick, creamy pus, very fœtid. At times the urine would be clear, and at others purulent. At first he lost but little flesh, and seemed to suffer but little from colicky pains, which were always relieved by chloral. He lived twenty-nine days from the time of the injury.

Autopsy.—There was gangrene of the rectum at the seat of the injury, and sloughing from healthy tissues. The opening in the rectum was about 3½ inches in diameter. There was an abscess in the pelvic cavity, also one on the pelvis of the right kidney, and one in the inguinal swelling of the right side. All the organs otherwise were healthy.

EXTRACTS.

PASTEUR'S TREATMENT OF HYDROPHOBIA.

An abstract of the Report of the British Committee of Inquiry.

The following abstract is given in the *Lancet* for July 2:

"The report of the committee nominated by the President of the Local Government Board in April, 1886, to inquire into M. Pasteur's treatment of hydrophobia, was presented to Parliament on Monday last.

"The report commences by stating that it was found necessary that some of the members of the committee should, together with Mr. Victor Horsley, the Secretary, visit Paris so as to obtain information from M. Pasteur himself, to observe his method of treatment, and investigate a considerable number of cases of persons inoculated by him; and, further, that a careful series of experiments should be made by Mr. Horsley on the effects of such inoculation on the lower animals. Mr. Horsley's experiments are stated to entirely confirm M. Pasteur's discovery of a method by which animals may be protected from the infection of rabies. If a dog, rabbit, or other animal be bitten by a rabid dog and die of rabies, a substance can be obtained from its spinal cord which, being inoculated into a healthy dog or other animal, will produce rabies similar to that which would have followed directly from

the bite of a rabid animal, or differing only in that the period of incubation between the inoculation and the characteristic symptoms of rabies may be altered. The rabies thus transmitted by inoculation may, by similar inoculations, be transmitted through a succession of rabbits with marked increase of intensity. But the virus in the spinal cord of rabbits that have died of inoculated rabies may be gradually attenuated by drying the cords, so that after a certain number of days' drying it may be injected into healthy rabbits or other animals without any danger of producing rabies; and by using on each successive day the virus dried during a period shorter than that used on the previous day an animal may be made almost certainly secure against rabies, whether from a bite or from any method of subcutaneous inoculation; and this protection is proved by the fact that, if animals so protected and others not thus protected be bitten by the same rabid animal, none of the first set will die of rabies, and, with rare exceptions, all of the second set will succumb.

"It may hence be deemed certain that M. Pasteur has discovered a method of protection from rabies comparable with that which vaccination affords against infection from small-pox. It would be difficult to over-estimate the importance of the discovery, whether for its practical utility or for its application in general pathology. It shows a new method of inoculation, or, as M. Pasteur sometimes calls it, of vaccination, the like of which it may become possible to employ for protection of both men and domestic animals against others of the most intense kind of virus. The duration of the immunity conferred by inoculation is not yet determined; but during the two years that have passed since it was first proved there have been no indications of its being limited. The preventive treatment by M. Pasteur is based on the foregoing experience; but the determination of the success of the method is far from easy, owing to (1) the difficulty in determining whether the bites were really those of rabid animals; (2) the probability of hydrophobia in persons bitten by dogs that were certainly rabid depending very much on the number and character of the bites, whether they were on exposed parts or parts protected by clothing; and in all cases in the amount of bleeding; (3) in all

cases the probability of infection may be affected by speedy cauterizing or excision of the wounded parts, or by various washings, or other methods of treatment; (4) the unequal danger of bites of different species of animals, and even of different dogs. In some groups of cases the percentage of deaths among persons bitten by dogs believed to have been rabid has been estimated at only 5 per cent., in others at 60 per cent., and the mortality from the bites of rabid wolves has been variously estimated at from 35 to 90 per cent.

"By the courtesy of M. Pasteur the committee were enabled to personally investigate ninety cases treated by him, these being mostly those which had been earliest treated, in which the periods since inoculation were longest, and living within reach in Paris, Lyons, and St. Etienne. Among the ninety cases there were twenty-four in which the patients were bitten on naked parts by undoubtedly rabid dogs, and the wounds were not cauterized or treated in any way likely to have prevented the action of the virus; there were thirty-one in which there was no clear evidence that the dog was rabid; others in which the bite had been inflicted through clothes. It is estimated, from the experience of the results of bites in other cases, that, had they not been inoculated, not less than eight among these ninety persons would have died. Not one of them has shown since the inoculation any signs of hydrophobia.

"Since, in order to quiet fears, M. Pasteur has been obliged to inoculate many in whom there was no satisfactory evidence that the bite was that of a rabid animal, it might be unjust to estimate the total value of his treatment in the whole of his cases as being more than the rate of mortality observed in them compared with the lowest rate observed in any large number of cases not inoculated. This lowest rate may be taken at 5 per cent; and, as between October, 1885, and the end of December, 1886, M. Pasteur inoculated 2,682 persons (including 127 from this country), the mortality should have been 130. But at the end of 1886 the number of deaths was 31, including 7 bitten by wolves, in whom the symptoms of hydrophobia appeared while they were under treatment; in fact, the actual percentage mortality was be-

tween 1 and 1.2, showing, on the lowest estimate, the saving of not less than 100 lives. Of 233 persons bitten by animals in which rabies was proved, only 4 died. Without inoculation, at least 40 would have died. Among 186 bitten on the head or face by animals in which rabies was proved, only 9 died, instead of at least 40. Of 48 bitten by rabid wolves, only 9 died, instead of nearly 30. Between the end of last December and the end of March, M. Pasteur inoculated 509 persons bitten by animals proved to have been rabid; only 2 have died, one of these, bitten by a wolf a month before inoculation, dying after only three days' treatment. The committee think it therefore certain that the inoculations practised by M. Pasteur have prevented the occurrence of hydrophobia in a large proportion of those who, if they had not be so inoculated, would have died of that disease. And his discovery shows that it may become possible to arrest by inoculation, even after infection, other diseases besides hydrophobia. His researches have also added very largely to the knowledge of the pathology of hydrophobia, and supplied a sure means of determining whether an animal which has died under suspicion of rabies was really affected with that disease or not."

The question whether the method itself entails risk to health or life is then discussed, the distinction between the ordinary method and the "intensive" method being pointed out. By the first method there is no evidence or probability of any danger to health at all; but after the intensive method, which is only practiced in the most urgent cases, deaths have occurred which might possibly be attributed to the inoculations rather than to the original infection. Yet in the worst cases the intensive method is relatively more efficacious than the ordinary method, nor is the rate of mortality greater after the former method than after the latter. Certain cases, one of which is detailed, have, however, excited suspicion from the mode of death. The case related is that of a man bitten by a rabid cat at the Brown Institution, treated by M. Pasteur the next day by the intensive method, continued during twenty-four days, and dying about a month later with symptoms of acute ascending paralysis. The man was very intemperate, and had been exposed to chill while crossing the

Channel on his return home. Mr. Horsley proved that his death was due to the virus of rabies, by using a portion of his spinal cord for the inoculation of rabbits and dogs, who died with characteristic signs of paralytic rabies such as usually occur in rabbits. Yet it is by no means certain that the fatal issue in this and in other cases treated by the intensive method was not due to the original infection. M. Pasteur has, however, greatly modified this plan of treatment, which he employs in none but the most urgent cases.

"The final paragraphs of the report, which embody practical suggestions, may be given *in extenso*:

"The consideration of the whole subject has naturally raised the question whether rabies and hydrophobia can be prevented in this country. If the protection by inoculation should prove permanent, the disease might be suppressed by thus inoculating all dogs; but it is not probable that such inoculation would be voluntarily adopted by all owners of dogs, or could be enforced on them. Police regulations would suffice if they could be rigidly enforced. But to make them effective it would be necessary (1) that they should order the destruction, under certain conditions, of all dogs having no owners, and wandering in either town or country; (2) that the keeping of useless dogs should be discouraged by taxation or other means; (3) that the bringing of dogs from countries in which rabies is prevalent should be forbidden or subject to quarantine; (4) that in districts or countries in which rabies is prevalent the use of muzzles should be compulsory, and dogs out of doors, if not muzzled or led, should be taken by the police as 'suspected.' An exception might be made for sheep-dogs and others while actually engaged in the purposes for which they are kept. There are examples sufficient to prove that by these or similar regulations rabies, and consequently hydrophobia, would be in this country 'stamped out,' or reduced to an amount very far less than has hitherto been known. If it be not thus reduced, it may be deemed certain that a large number of persons will, every year, require treatment by the method of M. Pasteur. The average annual number of deaths from hydrophobia during the ten years ending 1885 was, in all Eng-

land, 43; in London alone, 8.5. If, as in the estimates used for judging the utility of that method of treatment, these numbers are taken as representing only 5 per cent of the persons bitten, the preventive treatment will be required for 860 persons in all England; for 170 in London alone. For it will not be possible to say which among the whole number bitten are not in danger of hydrophobia, and the methods of prevention by cautery, excision, or other treatment, cannot be depended upon."

The report is furnished with an appendix containing (A) an abstract report of Mr. Horsley's experiments; (B) a report on persons in France examined by members of the committee, with a list of English persons treated at the Pasteur Institute from January, 1886, to January, 1887; and (C) on M. Pasteur's methods of preventive inoculation. The report is signed by James Paget (chairman), T. Lauder Brunton, George Fleming, Joseph Lister, Richard Quain, Henry E. Roscoe, J. Burdon Sanderson, and Victor Horsley (secretary).

AN EXPERIMENTAL RESEARCH UPON RABIES.

At a meeting of the Philadelphia Academy of Surgery, held February 7, 1887, Dr. Harold C. Ernst, of Boston, read a paper on the above subject.—(*Medical Times.*)

His experiments were performed with three objects in view: first, to determine whether or not there was such a thing as a virus of rabies; secondly, if there is such a virus, does drying at an even temperature modify its strength? thirdly, does the inoculation of such modified virus afford immunity against the inoculation of a stronger virus?

The different series of experiments relating to these various points were then given in detail. The animals used in most of the experiments were rabbits, although guinea-pigs and dogs were also employed.

The following conclusions were reached:

1. That there exists in the cords and brains of animals inoculated in Pasteur's laboratory a *specific virus* capable of the production of similar symptoms through a long series of animals.

2. That these symptoms are produced with absolute certainty when the method of inoculation is by trephining the skull and injection under the dura mater; with less certainty when the inoculation is by subcutaneous injection.

3. That the strength of this virus is lessened when the cords containing it are removed from the animals and placed in a dry atmosphere at an even temperature.

4. That the symptoms produced by inoculation of this virus only appear at a certain period of incubation, distinctly shorter when the inoculation has been done by trephining than when done by subcutaneous injection.

5. That injections of the virus modified in strength by drying, and in the manner prescribed by Pasteur, exert a very marked protective influence against an inoculation with virus of full strength.

6. That a very moderate degree of heat destroys the power of the virus entirely, whilst prolonged freezing does not injure it.—*Therapeutic Gazette.*

CORRESPONDENCE.

VETERINARY LITERATURE.

Editor American Veterinary Review:

I have never before sought the columns of your publication with suggestion or complaint. In fact I have only recently stepped upon the arena of veterinary science, and it seems to me to be both prudent and wise, not to say modest and in good taste, that the younger members of the profession should rather study the experiences and conclusions of the older practitioners, and endeavor to gain wisdom from their words as they detail them through our periodicals and text-books. This I try to do, and while I felt certain that there is sufficient in the veterinary literature of to-day to occupy the thoughts and ambition of the average veterinarian, yet one is apt to form a preference in reading, and

establish confidence in the words of the author. Standard veterinary volumes are not so numerous but that one may possess them all, and then not have a very extensive library. Among our works there are gems of excellent thought and observation, well compiled, and standing as monuments to the brains and energy of their authors. But there is one man whose prolific delineations shine so brightly in the firmament of veterinary science, whose observations are so true to the subject, and the story so well told that we are never tired of the recitation, that it does appear to me as ungrateful to his genius and unjust to the rising generation of veterinary surgeons that their value should be allowed to become impaired solely by the lapse of years and the advance of science. I refer to the writings of William Percivall. Veterinary surgery has made such gigantic strides since the time of Percivall that many of the problems which his keen intellect simply suggested have been developed into positive truths; and, again, many views which were truisms in his day have since been proven fallacies by the increased facilities for study through the microscope and other modern scientific inventions for minute experimentation and discovery, that the true value of the work is in a measure lost to the reader. Percivall's pen was as gifted to portray his thoughts as his innate genius was to grasp a truth; his sentences are so smooth, his English so pure, that one often rests from the reading to admire the beauty of a description, and so clearly does he state his meaning that when the book is laid aside the writer's ideas are indelibly left with the reader.

No recent writer has supplanted the great author; it is not likely that his superb works will be eclipsed for many years to come.

The subject of this communication is a suggestion: Why not have his writings revised and brought forward to keep pace with the march of science; the accepted truths to be perpetuated; new discoveries added; certain exploded theories of his time expunged, and all made to conform with the progress of the age? Could not this be done under the auspices of our National Association, that body appointing a committee to select a man for that important work; or, if not by that means, why not a private individ-

ual of talent and experience undertake it? The reward of fame and dollars would be enough to satisfy the ambition of any man. I am sure that I have in my mind at this time a man who is eminently fitted for this task; one whose unostentatious modesty would obstruct his progress unless he were shown it to be his certain duty to the profession he loves so well. Unless one has studied veterinary medicine at the American Veterinary College, he could never know the worth of James L. Robertson, the Professor of Equine Pathology, and I am positive that every alumnus of that institution will join me in this tribute to that profound thinker and superb observer. Who can estimate the value of William Percivall's works revised by James L. Robertson? Those who have been so fortunate as to catch the words of wisdom as they fell from his lips must have seen reflected the teachings of the old English master. He is, in truth, a modern Percivall. Let him cast aside the bushel which has bedimmed for so long the brilliant candle of his genius, and do for the profession of his choice a service which will place his fame high among those who have never had the good fortune to be his pupil—those are already his votaries.

If others have suggestions to accomplish the object in view, no doubt there are many who would be glad to read them.

A Classman of '87.

LARGE DOSES OF QUININE.

Editor American Veterinary Review:

I think it would be well if practitioners would put on record all incidents of excessive doses of medicine, with the results attending same, whether it is the result of accident or otherwise.

On the 4th inst. I prescribed for a case of pneumonia the ordinary boll, with a drachm of quinine; through a mistake, one ounce was added to each boll; one was given at 10 A. M., and at 7 P. M. I saw the horse; he was sweating freely, pulse quite full, temperature had fallen from 104° to 101°. Another boll was

ordered to be given, which was done, but before the mistake was discovered. I visited the horse about 9 A. M. on the following morning and was met by a whinnying welcome, to which I at once responded by giving a small feed of oats, which was soon put out of the way. On examination, I found the pulse not so full, body quite dry, but the temperature was back to 104°.

Here was a case where two ounces of quinine had been given inside of nine hours, without any remarkable result, except showing the effect of so large a dose—the largest, I believe, that has ever been given to a horse. I might here say that lately I have tried eserine and pilocarpin in azoturia, but without any good result. The former to assist the cathartic, and the latter for its diaphoretic action. The case terminated fatally before I had a fair chance of getting any passage of the bowels, but the action of the pilocarpin was well marked. I injected hypodermically 11 grains, and had a powerful diaphoretic action, which I believe would have had a very beneficial result if it had been used at once. The effect on the temperature was that it fell two degrees in fifteen minutes, but in a little over an hour it went from $2\frac{3}{5}$ to $5\frac{2}{5}$ and kept rising steadily till it reached $107\frac{1}{5}$ and ended in death. The large dose of aloes and the hypodermic injection of two grains of eserine was given about ten hours before the horse died, at which time the cathartic was begining to act.

W. H. PENDRY.

LIST OF VETERINARY PRACTITIONERS

REGISTERED IN THE RICHMOND COUNTY CLERK'S OFFICE, STATEN ISLAND, N. Y.

H. W. Bath.....American Veterinary College

H. E. Earle.....Columbia College

P. C. Juhl.....Royal Vet. Agricultural College, Copenhagen, Denmark

Wm. Rose.....N. Y. College Vet. Surgeons

Jas. McKee..... " " "

SOCIETY MEETINGS.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of the Keystone Veterinary Medical Association was held in the Veterinary Department of the University of Pennsylvania.

The President, Professor Huidekoper, called the meeting to order at 8 P. M.

The following members were present: Drs. Huidekoper, Zuill, Hoskins, Glass, Goentner, Weber, J. K. Raynor, T. B. Raynor, Kooker.

The minutes of the previous meeting were read, and approved as read.

Dr. Zuill, chairman of the Committee on Entertainment, offered the following report:

The committee meeting at Dr. Glass's office to decide as to the best means of providing papers for the meetings of the Keystone Association, resulted as follows:—

First. *Resolved*, That each member of the Association be assigned a subject by the committee, upon which he will be expected to write. If the subject chosen be not suitable to the member, he shall be allowed to make his own choice and to announce the same to the committee, in writing, at least one month before the date of reading, at a regular meeting of the Association, when, if it be acceptable to the committee, it shall be so announced.

Second. *Resolved*, That the subjects to be discussed shall be assigned in alphabetical order.

Third. *Resolved*, That members failing to comply with these requirements, in not preparing the papers so assigned, or failing to read them on the proper dates, without sufficient excuse satisfactory to the committee, shall forfeit their membership in this Association, and shall be reinstated only upon a unanimous vote.

Fourth. *Resolved*, That the President of this Association appoint a member to report (in writing) to this Association a case occurring in his practice, at a meeting following his appointment. (Signed) W. L. ZUILL,
W. S. KOOKER,
ALEXANDER GLASS.

On motion, the report was received, and the committee discharged.

Prof. Huidekoper moved that at the next meeting the report be offered as an amendment to the By-Laws; that further business be dispensed with, and that we adjourn to the lecture room. Carried.

Profs. Huidekoper and Zuill then presented ten newly graduated students, and, with the members of the Keystone, all partook of a sumptuous collation, from which your Secretary was compelled to withdraw in order to catch the midnight train. CHAS. S. GOENTNER, *Secretary.*

MASSACHUSETTS VETERINARY ASSOCIATION.

The fourth annual meeting of the Massachusetts Veterinary Association was held at Young's Hotel, Boston, April 27th, at 6 o'clock P. M., President F. H. Osgood presiding.

There were present: H. L. Alderman, D.V.S., of East Lexington; A. Marshall, M.R.C.V.S., of Brookline; F. H. Osgood, M.R.C.V.S., of Springfield; J. F. Winchester, D.V.S., of Lawrence; M. Bunker, D.V.S., of Newton; M. O'Connell, D.V.S., of Holyoke; W. H. Hitchings, D.V.S., of Somerville; T. Blackwood, V.S., W. Bryden, V.S., A. Peters, M.R.C.V.S., J. S. Saunders, D.V.S., L. H. Howard, D.V.S., of Boston; also, as invited guests: R. McLean, D.V.S., and W. H. Rose, D.V.S., of the Bureau of Animal Industry.

After the reading of the minutes of the previous meeting and of reports of various committees, the election of officers for the ensuing year was proceeded with, the result being as follows, and the vote in each case unanimous:

President—John S. Saunders, D.V.S., of Boston.

First Vice-President—Joseph M. Skully, V.S., of Boston.

Second Vice-President—Alexander Marshall, M.R.C.V.S., of Brookline.

Secretary and Treasurer—L. H. Howard, D.V.S., of Boston.

Executive Committee—Thomas Blackwood, V.S., of Boston; Austin Peters, M.R.C.V.S., of Boston; H. L. Alderman, D.V.S., of East Lexington; J. F. Winchester, D.V.S., of Lawrence; F. H. Osgood, M.R.C.V.S., of Springfield.

The annual report of the Secretary was then read, it being a summary of the business transacted at the various meetings of the year; of the papers read and discussions thereon, both by members and others; and an enumeration of the pathological specimens exhibited and interesting cases reported. The incorporation of the Association was mentioned as the most important occurrence of the year, and the report showed the roll of membership to have increased and several applications for membership pending.

The report of the Treasurer was then read, and, together with the report of the Secretary, was voted accepted as read.

M. O'Connell, D.V.S., of Holyoke, was elected to membership by a unanimous vote.

Applications for membership were received from Wm. H. Hitchings, D.V.S., of Somerville, and C. P. Lyman, F.R.C.V.S., of Boston, and referred to the Executive Committee.

On motion of Dr. Howard, Dr. A. Liautard, of the American Veterinary College, was elected to honorary membership by a unanimous vote; various remarks in support of the motion and complimentary to Dr. Liautard, being made by Drs. Winchester, Osgood, Blackwood and Saunders.

No other business coming before the meeting, it adjourned to dinner, where the remainder of the evening was passed very pleasantly by the members and their guests, Dr. Bryden officiating as toast master.

L. H. Howard, *Secretary.*

CONNECTICUT VETERINARY MEDICAL ASSOCIATION.

Owing to the increasing interest taken in the advancement of veterinary science in Connecticut during the past two or three years, the members of the Connecticut society determined last fall to apply to the January session of the General Assembly of that State for a special charter of incorporation. Accordingly,

they secured the services of ex-Mayor Greene Kendrick, of Waterbury, who, as attorney, drafted a compact and comprehensive charter, and secured its passage, the act having been approved by the Governor March 8th, 1887.

Under this charter the Association becomes a corporate body, possessed of all the powers and assuming all the duties of a corporation. Pursuant to the terms of the act, the first meeting of the Association was held at Waterbury, Conn., in the parlors of the Cooley House, June 7th, 1887. A large representation of the best known and most prominent veterinarians of the State were present, among them being Messrs. E. C. Ross, Thomas Bland, A. D. Sturges, A. A. Tuttle, Nathan Tibbals, and others.

After partaking of a bountiful collation, served in Landlord Cooley's best style, the Association began the work of organization.

E. A. McLellan was elected President; A. D. Sturges, 1st Vice-President; W. K. Lewis, 2d Vice-President; Nathan Tibbals, Treasurer, and Thomas Bland, Secretary. The censors chosen were: Messrs. Bland, Ross, Sullivan, Sturges and Tuttle.

Mr. Kendrick, attorney for the corporation, was also present, and explained the new charter, its purposes, the methods of procedure under it, and its results.

The Association then adopted a constitution and by-laws adapted to the new order of things.

Under a suspension of rules, Drs. Bridges, Lamberton and Hyde were admitted as members of the corporation.

After a general discussion of the veterinary interests of the State, showing a very gratifying progress in veterinary science and skill, the Association adjourned to meet on the first Tuesday in September, 1887, at New Haven. The subjects announced for discussion at that time were "Veterinary Jurisprudence" and "Influenza, its complications, causes and treatment." The Association numbers about twenty members, and the prospects of its speedy growth are very encouraging.

In connection with this subject, it might not be amiss to state that at the time of application for a charter the Association also sought to secure the passage of an act for the regulation of veterinary practice. A full hearing was given to this proposed measure, and, on its merits, the Assembly would doubtless have enacted it into a law. Unfortunately, at the very time of its consideration, another bill, extremely radical and in many respects considered quite objectionable, for the regulation of the general practice of medicine in the State, was presented by the regular practitioners of the allopathic school. In the opposition which this latter bill created and the instrumentalities used to defeat it, the very meritorious bill to regulate the practice of veterinary medicine and surgery was also defeated, owing to a mistaken idea on the part of the Assembly that, to be consistent, they must, in defeating one bill, treat the other to the same dose.

Although Connecticut, therefore, has as yet no well formulated law to protect domesticated animals from quack treatment, public opinion is fast progressing in favor of the passage of such a law, and the Association, aided as it will be by the Connecticut Agricultural Society and the Connecticut Humane Society, has every reason to expect that the next session of the Legislature will place this much-needed law upon the statute book of the State.

THOMAS BLAND, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

The regular semi-annual meeting of the Ohio State Veterinary Medical Association was held in the parlors of the Hawley House, Cleveland, O., July 12th, at 10 A.M.

The President, Dr. J. C. Meyer, Jr., called the meeting to order.

On roll call, thirty-five members answered to their names.

The minutes of the previous meeting were read and approved.

The President addressed the Association, stating its objects, etc., and expressed his pleasure at the large attendance present.

The Committee on Veterinary Legislation, composed of Drs. D. P. Yonkerman, Lee, Howe, Meyer and Shaw, made a report, which was accepted.

Letters of regret were read from Prof. Liautard, Principal of the American Veterinary College, and from Drs. Hammil and Pendry, New York.

Prof. Smith, Principal of the Ontario Veterinary College, was present and made an address. He expressed pleasure at meeting our Association, and was well pleased with the harmony which prevailed among the profession in Ohio.

The following gentlemen were then admitted as members of the Association: Drs. W. G. Torrance, R. G. Holland, W. H. Gribble, Wm. McNaughton, W. C. Daniels, Benj. C. McLain, and J. D. Fair. They were introduced, and addressed the Association in a few well-chosen remarks.

Dr. Wight moved an adjournment for dinner.

The Association met at Dr. W. C. Fair's Veterinary Infirmary at 2 P.M., where a number of successful operations were performed. Dr. F. E. Anderson operated on a case of fistulous withers. Dr. J. C. Meyer, Jr., spayed a bitch. Dr. D. P. Yonkerman removed a large melanotic tumor from the abdomen of a dog. Dr. G. W. Butler operated on a ridgling horse.

The Association reconvened in the parlors of the Hawley House at 7 P.M.

Dr. D. P. Yonkerman was called upon, and read a well composed and instructive essay on "Beef inspection as a part of public hygiene."

A lively discussion followed, in which the following gentlemen took part: Drs. Newton, W. C. Fair, Howe, D. P. Yonkerman, Shaw, Torrance, Blanchard, J. Yonkerman, and Derr.

Dr. T. Bent Cotton followed with a paper on "Ridgling Castration," which was generally discussed.

Dr. A. H. Logan exhibited specimens of dental deposits removed from the sup. maxillary sinus of a five-year-old horse. These were 400 in number, and of various shapes and sizes, and were inclosed in and attached to a special membrane.

A number of the members present criticized the working of the People's Mutual Live Stock Insurance Association of Cleveland, O., and censured the action of some of their appointed veterinarians.

A vote of thanks was tendered Prof. Smith for his attendance and the interest he has taken in the advancement of the veterinary profession. Prof. Smith responded with a few remarks.

A vote of thanks was also tendered the proprietors of the Hawley House for courtesies extended, and the Association adjourned, to meet at Akron on the second Tuesday in January next. A. H. LOGAN, V.S., *Cor. Secretary.*

AMERICAN VETERINARY REVIEW,

SEPTEMBER, 1887.

EDITORIAL.

STAMPING OUT PLEURO-PNEUMONIA.—The work of the Bureau of Animal Industry promises good results—now in New York and hard at work—Report of Dr. Salmon showing what has been accomplished up to June 30th—Illinois reported almost entirely free—enormous work of investigation performed by the inspectors—5,351 herds have been inspected, 49,094 animals examined; 4,851 post-mortem examinations made, and 1,044 carcasses found diseased. GLANDERS IN MONTANA.—The usefulness of sanitary reports once more illustrated—they would show the extent of contagious diseases amongst our stock—Dr. Holloway's statement—glanders now spread from army horses and mules sold instead of being killed after being condemned—great want of reform somewhere. UNITED STATES VETERINARY MEDICAL ASSOCIATION.—The meeting is to take place in New York city on the 20th of September—great anticipation of a good meeting. *Another paper for the Prize*—offered and presented in this number.

STAMPING OUT PLEURO-PNEUMONIA.—The work of stamping out pleuro-pneumonia, undertaken under the supervision of the Bureau of Animal Industry, gives fair promise of accomplishing a satisfactory result, and, as we have before had occasion to remark, seems likely to prove to be the means of wholly banishing this formidable and destructive disease from this country. If there is no suspension or diminution of the appropriation, and no interference with the work as it has been recently prosecuted, no one will ever regret the large amount of money our deliverance from the pest will have cost.

The work which heretofore has been carried out principally in the West and in some of the Eastern States, has been recently inaugurated in New York, and though at first the presence of the disease was denied by the same, the officers of the Bureau of

Animal Industry now have their hands full and are hard at work in destroying diseased and infected animals.

A recent preliminary report from Dr. Salmon, Chief of the Bureau, touching the progress of the work as partially accomplished, furnishes us with the means of estimating the amount of labor performed during the six months ending June 30, 1887, and is a very interesting and instructive paper. Taking into consideration the fact that the new rules and regulations which have been issued by the Bureau have been accepted by many of the States and Territories, and that the Legislatures of Illinois, New York, Virginia, and other States have enacted laws conferring full authority upon the officers of the Bureau for the quarantining, condemnation and destruction of all animals exposed to the disease, as well as those affected by it, we can readily appreciate the extent and value of the assistance rendered to the Board and the co-operation they have experienced in the prosecution of their labors.

Certainly those who have charge of the work are enjoying no sinecure in their official positions, as the figures indicate which we extract from the report.

During the six months covered by the report the Bureau has inspected 2,368 herds in Illinois alone, and this number represented 12,361 animals. Of 3,183 post-mortem examinations made, 299 of the subjects were found to have been affected with pleuro-pneumonia. In Maryland 2,406 herds were inspected, 1,253 autopsies made, and 74 animals found diseased. In New Jersey 453 herds were inspected and 284 animals found infected. In New York, so far, 79 herds have been inspected, 987 animals found infected, and 127 reported diseased.

During these six months, then, 5,351 herds, numbering in all 49,094 animals were inspected, 298 herds and 11,628 animals placed in quarantine, and 904 animals found to be diseased. The enormous number of 4,851 post-mortem examinations were made, and 1,044, or nearly one-fourth of that number, were found to be affected with pleuro-pneumonia. If this amount of work does not furnish testimony which ought to be satisfactory to the faithfulness and assiduity of the veterinarians of the Bureau of Ani-

mal Industry, we do not know where to look for it. These figures form the best answer that can be given to those skeptical Congressmen, legislators, and even veterinarians, who some time ago recorded themselves as disbelievers in the existence among our cattle of the bovine scourge of which we are speaking. This, however, is a point of no importance.

If the Bureau of Animal Industry are wisely let alone, the day is not distant when their work will be reduced to the simpler, though not less important, duty of preventing the importation of the disease, the stamping out of which will have absorbed so much labor and involved so heavy an expense.

Glanders in Montana.—We have on several occasions urged upon our readers the importance of obtaining monthly or quarterly reports of the existence of contagious diseases throughout the country, and have invited their co-operation and assistance in the preparation of such information. There has been no response to our invitation, though the value and desirableness of these reports are constantly shown by the publications which we frequently find in our agricultural exchanges. We are all informed of the extensive existence of contagious pleuro-pneumonia; we are all aware of the slow but sure progress of tuberculosis amongst our costly herds; and we hear of the occasional outbreaks of anthrax, and so on; and we also hear, now and then, of outbreaks of glanders amongst horses. Of course this latter disease is known to exist, more or less, all over the land, yet communications relating to its mode of multiplying itself are always interesting, and so much the more when we are able to trace the cause or discover the center of infection, and learn how easily its prevention might have been accomplished, to the very great advantage of the horse owners who have suffered needless loss. If we are to accept the communication of the Territorial Veterinarian of Montana, Dr. Holloway, as authoritative, a large number of the cases seen by him may be traced to condemned army horses or mules, which, instead of being destroyed after their condemnation, have been venally disposed of by selling them, contrary to orders, by the persons to whom they were turned over for execution.

If this statement is correct, it is certainly a matter of which the courts, martial or criminal, should take hold of at once and promptly rectify, and our colleagues in the army should see that such villainy—it is nothing less—should be well disciplined. But what can an army veterinarian do, after all, while held in the low position he is now compelled to occupy, and so long as he is denied the rank and position which by right is his?

We append the statement of Dr. Holloway:

The fears that some months since were entertained concerning glanders seem to have been only too well founded. The disease has already made its appearance in nearly every portion of the territory; in fact, only one county (Beaverhead) has thus far escaped, and several cases have occurred so near its borders as the town of Melrose. The truth is, the more we investigate the more we find of it to deal with. Why, only yesterday I found six cases of it in Butte.

In a general way it may be said to be most frequently found along the main route of travel. We are, however, doing much to eradicate it, though the difficulties encountered are many. In the first place, Montana is larger than all New England, which in itself is a matter of much importance; and in the second, the people are not as yet fully alive to the necessity of taking the immediate steps that are necessary to completely squelch the disease. Because in former years they have escaped any serious trouble, they have quite naturally concluded they will be equally fortunate in the future.

In all countries that ever I have seen, there is always more or less of the trouble. Its causes are numerous and very generally understood, but I am quite reliably informed that a great deal may be traced to our military posts. The disease is quite likely to make its appearance where large numbers of horses or mules are kept in stables, such as are required by cavalry regiments or horse-car companies in large cities, without any specific cause. It has several times made its appearance at the forts located in Montana. Horses have been condemned and ordered shot, but the private soldiers to whom the duty was intrusted, instead of obeying orders, would take the animals out to a distance from the post, and instead of obeying orders would sell the animals, or a portion of them, to unscrupulous persons for perhaps five dollars, and they in turn would sell at an advance of five or ten dollars more. If the disease always plainly manifested itself, it could be much more easily controlled. There are many unscrupulous persons who for a few dollars will sell a glandered animal, and in so doing perhaps endanger the lives of a whole herd of animals. I remember one case in which a man sold an old mare suffering from the complaint, and he knew it, with the result of killing four mules that were quartered in the same barn with her.—*Nat. Live Stock Jour.*

United States Veterinary Medical Association.—The next anniversary meeting of the United States Veterinary Medical Association is to take place on the 20th of September, the

third Tuesday of the month, in New York city. The place of meeting has not yet been selected, but will be made known by the special notices sent by the Secretary of the Association as soon as he has been informed by the committee of arrangements.

From what we hear, an interesting meeting may be anticipated, several gentlemen of the Association having been personally requested to prepare papers for the occasion. With these and the reports of the various committees, and principally that of the Prize Committee, the chances are that no disappointment will befall those who will attend.

Another Paper for the Prize.—In referring to the report of the Prize Committee, we will call the attention of our friends and members of the Association to the fact that the paper on "Glanders" which has been printed in the Review will not be the only one placed in competition. We print another to-day. The manuscript was received at a rather late hour, but we hope that even at this time the committee will find opportunity for examination into its merits.

ORIGINAL ARTICLES.

MALADIE DU COIT—DOURINE.

By A. Liautard. *

(*Continued from page* 203.)

IV. *Diagnosis.*—It is difficult to mistake this disease for any other when its progress and the succession of its symptoms are carefully followed; still, if in the consideration of a case the local symptoms alone are taken into account, error is possible. For example, it is possible, in its inception, to mistake it for a simple exanthemous eruption of the genital organs, the seat of both lesions being the same, and the effect similar upon the visible parts of generation. The exanthematous disease, however, is of a benignant character, and it is followed by radical recovery after two or three weeks.

* Translated from A. Zundel.

The tumors upon the skin may suggest farcy, especially if there is enlargement of the glands and a discharge from the nose resembling that of glanders; but the tumors are not of the cordy kind, and they exist in the dermis of the skin and not under it, unlike farcy buds, which, again, ulcerate readily, and are principally situated on the legs.

V. *Prognosis.*—This is always serious and doubtful; though if there is an early recognition of the disease, recovery is possible. It is generally more serious in stallions than in mares, the disease being usually discovered earlier in the latter, and when they have already been infected, or when the secondary lesions manifest themselves. Authors who maintain the spontaniety of the disease, claim that the spontaneous form is more serious than that which results from contagion.

The prognosis is, moreover, always uncertain; animals very ill may recover, while in others in which the disease seems to be of a mild type, it may rapidly assume serious complications and end fatally. As a rule, the disease always becomes more serious when in an advanced stage than when it is recent.

VI. *Pathological anatomy.*—Besides the local lesions already described, with their symptoms, the vaginal and uterine membranes are observed to be thickened and ecchymosed, and to have assumed a brown or grayish color, while the cavities of these organs contain a quantity of muco-purulent substance, more or less abundant, of either a whitish, yellow or chocolate color, analagous to the discharge which escapes from the vulva during life. In some instances this liquid is present in quantities sufficiently large to distend the uterus to dimensions suggestive of a more or less advanced pregnancy.

In the male there is infiltration of the cellular tissues of the sheath and of the scrotum, the latter becoming transformed into a dense, homogeneous, cartilaginous-looking mass. The mucous surface of the vesicula seminales is at times red or purplish, and contains a thick yellow, purulent-looking matter. The testicles are not always involved in the disease; when they are, there is a degree of atrophy in the middle of the sub-dartoic connective tissue, which is indurated or infiltrated with a yellowish serosity;

while in other cases they are increased in size and their softened tissue becomes of a gray, red or even brown color, and pseudo-tuberculous and purulent cavities have been found in them. The spermatic cord and the epididymis are thickened and surrounded with deposits of yellowish matter, gelatinous in consistency and of hyaline aspect.

These local lesions are often associated with anæmia and a general loss of flesh. The heart and the large blood vessels are flabby, and the blood unctuous and adhesive, with a diminution in the proportion of the red globules. The intermuscular cellular tissue is filled with a yellow, gelatinous infiltration, and the flesh is soft and easily torn. Serous infiltration, and at times indurations, are found in the subcutaneous cellular tissue. The neurilema of the large nervous trunks of the paralyzed legs contains tumefactions, and these are surrounded by a thick infiltration. In many cases there is also infiltration over both the spinal marrow and the encephalon, and the whole cerebral and spinal mass is more or less softened. There is a loss of transparency in the arachnoid, and sometimes a large accumulation of serosity is found in the sub-arachnoid space.

For the cause of the metastatic diseases which are found in the testicles and the lungs—more often in the latter—we know we must look to the lesions of complication, such as the articular manifestations, or those arising from purulent infection.

VII. *Etiology.*—We have already said that the disease is only seen in breeding animals, and that it is communicable only by the act of copulation. In districts where it appears it is therefore generally easy to trace the infection of the mare to the stallion by which she has been covered. And reciprocally, a healthy stallion may in the same manner derive the disease from an infected mare.

Nothing positive is known as to the spontaneous development of this disease, and it cannot be ascertained with any degree of assurance whether the abuse of the genital function of the male, or the existence of a vaginal catarrh in the female, can be considered as occasional causes. There are authors, like Haubner, who admit that it might arise from a chronic affection of the

vagina, from leucorrhœa, the sequellæ of parturition, or the like, and in this manner originate in some form of special infection, possibly of the cryptogamic kind. Those who adopt this view of the matter seem evidently to have confounded the true dourine and its causes with the mere benignant exanthema of which we have spoken.

It cannot be confidently said whether the disease exists primarily in the stallion or in the mare, though it is quite certain that it has been imported into many countries by stallions recently purchased, and communicated by them to the mares they have served, which latter have, in turn, infected other stallions.

The most rational hypothesis is that which includes dourine with other contagious diseases, in which the theory of spontaniety is unknown, and accepts the sexual contact as the only method of propagation known to its history. Nothing is yet known of the specific action of the product of the secretion seen in the disease, nor of its virulent properties. The virus has a fixed character, and the principal vehicles of contagion are the products of secretion of the urethra in the male, and of the vagina in the female. The matter of contagion is more active than that of the virus of many other contagious diseases; from one-third to one-half of the mares covered by a sick stallion being liable to contract the disease, and the contagion from the male to female being no less dangerous, and it preserves its contagious quality for a long time, and quite beyond the time of recovery. Haubner believes that the virus may retain its force for a year or more.

The disease is inoculable, though experiments in this respect have not always succeeded (Hertwig); virulent mucus must be used, inoculations with the blood having proved negative. It is also transmissible by contact; diseased mares may convey it to healthy ones if contact of the genital organs is possible; but cases of this description are rare. It is only by this kind of contagion that the appearance of the disease in colts (Weber, Jessen, Maresch) and even in geldings (Hayne, Dayot) can be explained. Manipulations by hostlers in cleaning with soiled sponges, for instance, have been a means of contagion (Haubner). These occurrences are, however, all exceptional, and copulation must be un-

derstood and accepted as the obvious and principal means of infection.

The duration of the incubation varies from eight days to two months, according to Maresch, and even longer according to Haubner.

Whether it is communicable to other domestic animals has not been observed; the equine and asine species alone are known to be subject to it. We may remark, however, that persons employed in the care of diseased animals have at times been known to suffer with an eruption on the hands of little vesicles, forming small superficial ulcers, which, however, healed rapidly, and seemed to possess no specific character, but rather to be of the same nature as those likely to arise from any septic contact.

The heredity of dourine has been affirmed by Rodloff and Jessen. The march of the maladie du coit, as an epizootic, is no less singular than its movements in the sporadic form. Its invasion always occurs during the breeding season, or through the months of April, May and June, when the first cases are observed, though a few late cases may occur in July and August. The following year it appears on a larger scale, but towards the third year it diminishes considerably, or may even quite disappear—nearly always, however, to reappear in another locality in the neighborhood of the first invasion (Lafosse). This habit is due to transmission of the disease by displacement, and might be prevented by suitable sanitary precautions.

VIII. *Treatment.*—Hygienic measures are of essential value in the treatment of dourine. Rich and healthy feeding, healthy and comfortable stabling, protection against extremes of heat and cold, good bedding and cleanliness, are all most essential.

In mares, when the inflammation is acute, tepid mucilaginous vaginal injections are indicated, to be subsequently replaced by aromatic and even astringent applications, such as preparations of sulphate of zinc, permanganate of potash, alum, carbolic acid, etc., with a view to soothe the inflammation and stimulate the cicatrization of the erosions.

In cauterizing such of the ulcerations as can be reached, sulphate of copper and nitrate of silver are to be preferred to preparations of corrosive sublimate.

In stallions, the local treatment is of course more difficult than in mares, from the fact that the sheath must be fomented and frequent injections made in the urethra. General treatment is of course necessary, especially in the stallions. Balsamic diuretics, such as turpentine in doses of one or two ounces, and drenches of creasote water, or carbolized or tar water, will act most efficaciously upon the urethral or vaginal catarrh; camphor and assafœtida, though recommended by some writers, has a less direct action.

Tonics have given the best results. Trelut has recommended hashed meat and fibrine from the blood; Rodloff prefers ferruginous preparations. Arsenic has acted very favorably in the hands of Trelut, who gives it in large doses, while we prefer to use it in small doses. Roell is in favor of nux vomica, and, with Strauss, the preparations of cinchona proved satisfactory. Alteratives, such as preparations of iodine or mercury, seemed to do harm, as have also sedatives, such as tartar emetic. External counter irritants have been recommended, including setons on the loins and hind legs, blisters, and the actual cautery. But to a debilitated patient all these do more harm than good. We would expect better results from dry frictions all over the body, through their general tonic and stimulating effects.

Much empiricism has no doubt characterized the treatment of maladie du coit. Too much thought has been bestowed on an unnecessary attention to the treatment of isolated lesions, and for this reason we object to the too complicated treatment of Rodloff. At the same time, it would not be wise to ignore the indications that necessarily present themselves in the appearance of mammitis, orchitis, abscesses, large infiltrations, or cutaneous ulcers, all or any of which the surgeon is liable to encounter.

IX. *Sanitary police.*—All old mares of a cachetic habit, with a discharge of suspicious nature from the vulva, as well as any stallion having sores suggestive of dourine, must be excluded from breeding purposes until their ailments are radically cured.

Veterinary inspection of all stallions in districts where the disease exists is an essential measure, and in such districts the covering of mares ought not to be permitted except between

males that have been inspected weekly and females known to be healthy at least three or four days before the act of copulation.

Breeders ought to become well acquainted with the disease, and should be enjoined to report to the proper authorities all cases coming to their knowledge. The animals reported should be strictly isolated, and persons in charge of the sick horses should have as little contact as possible with healthy animals.

The sale of breeding animals should be prohibited, and even when cured they ought to remain under careful watch until a satisfactory period has elapsed.

A recovered mare, even if her attack had been of the mildest form, should be excluded from breeding for a year after her recovery. Stallions ought not to be used for two or three years after apparent recovery.

Castration has been recommended. This has sometimes interrupted the spread of the disease, even in animals already presenting symptoms of paralysis. The success or failure of castration will be determined by the extent to which the general disease has affected the patient, as well as by the absence or presence of local lesions in the genital organs at the time of the performance of the operation. The sale of castrated animals ought not to be allowed until complete recovery can be fully certified.

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ETIOLOGY OF SCIRRHOUS CORD, FISTULA AND ABSCESS OF THE SCROTUM.

"CHAMPIGNON," (*Fr.*); "SAMENSTRAUGWUCHERUNG UND SAMENSTRAUFISTEL" (*Ger.*); AND PROPHYLAXIS OF THE SAME.

By "Trianon."

(In competition for Prize of the United States Veterinary Medical Association.)

Although only a tyro in the veterinary profession, I have often been confused by the conflicting theories of the various authors on the above named subjects.

Prof. Williams, in his "Principles and Practice of Veterinary Surgery," (chapter on "Castration," page 649), says: "Scirrhus of the cord arises from castration with the caustic clam, when the operator has neglected, while removing the clams, to separate the adhesions which always take place between the cord and the lips of the wound; from castration with the actual cautery, when the cord has been left too long, or when the cremaster muscle has suffered from some debility, and the extremity of the cord has remained in contact with the wounded scrotum, or has slightly protruded beyond the opening; and in order to prevent scirrhus of the cord, it is necessary when the operation is performed by the clam, that the operator should introduce his finger into the wound and gently separate the cord from the scrotum by tearing the adhesions asunder and pushing the cord upwards toward the abdominal ring."

In reference to chronic suppuration, or fistula of the scrotum, Prof. Williams says:

"I have frequently met with cases of a chronic induration of the cord, seemingly arising from the same cause as champignon, namely, adhesion to the scrotal wounds, in geldings of various ages. In such the cord is hard, and enlarged within the scrotum, and from time to time suppuration occurs within its substance; abscesses form and discharge an unhealthy purulent matter. The formation of these abscesses occurs periodically, and may be induced by very trivial exciting causes, such as a common cold or a

hard day's work; the cord then inflames, the animal becomes lame, stiff, feverish, and unfit for work, and will occasionally remain in this condition for several weeks after the abscesses have discharged their contents."

Prof. Liautard, in his work, "Animal Castration," refers to the causes of champignon as follows:

"The causes from which it originates are obscure, and cannot be very well defined; still, they may be arranged under the heading of any of the morbific causes which may excite an excess of inflammatory action at the end of the cord. Amongst these may be enumerated all violent tractions upon the cord at the time of the operation; all unnecessary manipulations during the process of cicatrization, such as the too frequent introduction of the finger into the wound with destruction of the granulations already adherent to the cord, and the application of the appliances for its division too low down upon it, leaving that organ hanging too much, and the retraction of the organ being insufficient to retain it in the inguinal sac; still, as a champignon may be developed in the absence of all these causes, it would seem that their growth may be attributed also to some specific idiosyncrasy in the animal affected, the true nature of which cannot be very accurately or easily understood.

"It is held, however, by certain German and Russian authors, that exposure to cold exercises a great deal of influence in the development of this affection, and observation has largely established the fact of its greater prevalence during cold seasons."

In regard to abscesses of the scrotum, Prof. Liautard says:

"When these are likely to result from a too rapid closure of the edges of the scrotal envelope, the premature union may be readily prevented, as we have before stated, by the careful introduction of the finger into the wound while it is still suppurating.

"But notwithstanding this precaution, they will sometimes occur as the result of the infiltration and accumulation of the suppurative matter. A free incision and proper attention to the cavity of the abscess is all that this accident requires.

"A careful examination of the parts will, however, reveal another cause for the formation of these abscesses. It is, then,

against these causes that the therapeutic treatment must be directed."

Of fistula of the scrotum, Prof. Liautard says: "Being already aware of several causes of this complication of the operation of castration, we may readily appreciate the treatment they require; it must be remembered that in a majority of cases the cause of this lesion is the presence of a foreign body in the wound, and that until it is removed it is in vain to look for a cure."

Prof. Smith, in his lectures on the diseases of the scrotum, says:

"These can generally be traced to some diseased condition of the spermatic cord, the result of castration, as scirrhus cord, abscesses, fistula, etc. Scirrhus cord may come in two or three weeks after castration, or it may come years after the operation. Abscesses may be caused by a foreign body, or may be due to the scrotum closing up before the cord is completely healed; matter is formed at the cord, it becomes dry, sets up irritation and results in an abscess; and when due to this it generally appears about three or four weeks after the operation, and it may be due to the incision not having been made large enough; so I again recommend a pretty large incision. It may come from a small piece of iron remaining in the wound, if actual cautery has been used, or it may be due to a ligature setting up irritation, and the ligature should be left long, so it can be removed.

"Abscesses generally seriously interfere with the condition of the animal; should be opened freely, but may form again and again."

In the *Deutsche Zeitschrift fur Thier-Medicin und Vergleichende Pathologie*, of May, 1886, Prof. Dr. Albert Jehne, of the Royal Veterinary College in Dresden, Germany, claims to have discovered a micro-organism in several scirrhus cords that were removed from horses at the clinic of the above named college; and he also says that he found the same organism in a tumor taken from the breast of a horse, said tumor having developed in an interval of about six months.

And in the same article Prof. Jehne states that he submitted

parts of one scirrhus cord to such prominent pathologists as Prof. Dr. Robert Koch, of Berlin; Prof. Ferdinand Cohn, of Breslau; Dr. Zimmerman, of Chemnitz; Dr. Huppe, of Weisbaden, and Prof. Dr. De Bary, of Strasburg, for examination, and in their conclusions these eminent men differ, some having failed to find the suspected organism.

I have several German authors on veterinary surgery in my possession, whose views on the above named subjects are substantially the same as those advanced by Prof. Williams.

Farmer Miles, the world-renowned castrator, in an answer to a letter from me, as to what caused the difficulties, attributes th cause to "improper surgery."

Having made the castration of cryptorchids a specialty during the summers of 1884–5, an occupation which brought me over an area of several States, I consequently came in contact with a great many veterinary surgeons and gelders, and was often asked to give my opinion as to what caused the difficulties. I would enumerate the probable causes, such as I had been taught, and the disapproval with which these theories were often met convinced me that the real cause was yet in obscurity.

That the trouble was not caused by the caustic clams I was convinced of in the State of Virginia, where innumerable colts are castrated annually with them, and are turned out to pasture as soon as the operation has been performed. The clams are allowed to remain on until they slough off, and from careful observation I am satisfied that the colts thus neglected are not any more prone to the affection than those that are well cared for, and I believe the theory is a mere supposition of the authors who have advanced it, and not a fact that has been substantiated by experiment or careful investigation.

As to whether or not the difficulties are caused by the actual cautery, I cannot say, as that barbarous method of castration is not practiced in the United States, to my knowledge.

As to the affections being caused by an organism, I can neither affirm nor deny, as I received the information too late in the season to make an investigation; but I do believe that if an organism does exist, it is only secondary.

That the difficulties can be produced independent of caustic clams, actual cautery, and ligature, can be seen by a tabulated list of experiments that I made with the *ecrasseur* on twelve colts during the summer of 1886. When I began these experiments I expected to produce nothing but scirrhus cords, but the result was fistula and abscess of the scrotum in some of the cases, although scirrhus cord predominated; and each cord had an abscess cavity, either in its center or near its posterior part. I would also state here that in all scirrhus cords that I have had occasion to remove, the results of work done by myself or other men, in each and every case I have found a pus cavity.

While dissecting a scirrhus cord of recent origin, in June, 1885, one in which the membranes of the vaginal sac were discernable, I discovered that the trouble was caused by a foreign body, such as blood pus, etc., being retained in a sac at the posterior part of the cord, the sac being formed by an inversion posteriorily (from the action of the cremaster muscle) of all that portion of the tunica vaginalis reflexa remaining uncut anterior to the fold band or septum, that is formed by the two serous coverings, in their connection with the tail of the epididymis; said inversion being favored by the breaking down of the cellular tissue connecting the tunica vaginalis reflexa to the infundibuliform fascia; the foreign body contained in this sac sets up an irritation which converts the serous membrane into one of a pyorganic nature.

It is a well authenticated fact that the best results in castrating the horse are obtained by dexterously making a large incision; but why the best results are thus obtained, has to this day remained empirical.

In conclusion, I would say: in order to prevent the difficulties, a large incision should be made not only through the scrotal tunics, but also through the serous envelope, or preferably include the latter with the cord in the ecrasseur, and amputate the whole above its connection with the tail of the epididymus, which obviates the receptacle for blood pus, etc., and insures perfect drainage.

Being thus prompted by my discovery, I determined to experi-

ment, and prove, if possible, whether I had found the right cause or not. The result was as follows:

Experiment No. 1.—May 10th, 1886, I castrated a native-bred colt, one year old; removed the left testicle properly; on the right side I left the posterior part of the tunica vaginalis reflexa uncut, broke down the cellular tissue between aforesaid tunic and infundibuliform fascia; inversion was complete; the wound on the left side healed up readily; right side did not heal; scrotum and sheath remained swollen; colt walked with a stiff gait; fell off in condition; there was a fistulous discharge from the wound until July 12th, 1886, when I removed the diseased cord, after which the wound healed up and the colt improved in condition at once.

Experiment No. 2.—May 10th, 1886, I castrated a native-bred colt, one year old; operation similar to that on No. 1, but result was different; both sides healed about the same time; scrotum on right side remained swollen; sheath would swell while colt was kept in stable; colt throve well. July 8th, 1886, I removed cord, enlarged and scirrhus, about the size of a goose egg; wound healed nicely; no enlargement left.

Experiment No. 3.—May 12th, 1886, I castrated a trotting-bred colt, one year old; made incision so as to produce the difficulty on left side; the result was a scirrhus cord the size of a hen's egg, which I removed June 19th, 1886, at the urgent request of the owner, who was anxious to have his colt right; scrotum and sheath were somewhat swollen until after the wound healed from the second operation.

Experiment No. 4.—May 15th, 1886, I castrated a grade percheron colt, one year old; operation similar to the preceding one; both wounds healed up; scrotum swelled considerably, and remained so; walk was somewhat stiff in hinder extremities; removed cord July 25th, 1886; it was scirrhus and enlarged, about the size of a goose egg; tumefaction of cord extended up into inguinal canal; could not remove all; colt has done nicely; no perceptible enlargement left.

Experiment No. 5.—May 16th, 1886, I castrated a native bred colt, two years old; a flanker or inguinal cryptorchid; made

incisions so as to produce the difficulty on both cords, and did it successfully. Scrotum and sheath swelled up very large; wound on left side did not heal; a fistula formed which discharged continually until August 4th, 1886, when I removed both cords. On the left side which had the fistula I found two lumps about the size of a walnut; on the right side three similar lumps, all of a scirrhus nature, and each one containing a pus cavity.

On Sept. 1st, 1886, I was called to attend the colt, the owner saying that he was suffering with sore eyes. Upon arriving at the stable I found my patient to be affected with tetanus. An examination of the scrotum revealed that the right side had healed and the left side was still discharging pus. I enlarged the opening with a lancet, bathed the parts with warm water, inserted a sponge saturated with fluid extract of belladonna into the wound, and by the free use of morphine internally I succeeded in rescuing my patient from the grasp of the disease. The wound healed up nicely; sheath continued swollen for some time, during which the colt walked with a straddling gait. Swelling gradually disappeared, and the animal is all right, with the exception of a pair of bog spavins, which he contracted one night in his struggles to get up while suffering with tetanus.

Experiment No. 6.—May 19th, 1886, castrated a native-bred one-year-old colt; produced scirrhus cords on both sides, about the size of duck's eggs. Removed them August 5th, 1886, after which the wounds healed nicely, and at present the scrotum is as smooth as can be wished for.

Experiment No. 7.—May 20th, 1886, castrated a grade percheron colt, one year old; made short incisions on both sides. Wounds healed nicely; scrotum and sheath were swollen some, a few days after the operation, and continued so until the latter part of June, when the swelling began to increase. On the 5th of July, 1886, the right side of scrotum opened spontaneously, from which, the owner said, a vast amount of pus escaped. Swelling then receded considerably; right side healed up in about four weeks. On Sept. 21st, '86, I removed the left cord, which was enlarged and scirrhus; there was no perceptible enlargement on the right cord at that time, nor has any appeared since.

Experiment No. 8.—May 28th, 1886, castrated a grade Clydesdale colt, two years old; produced two scirrhus cords, which I removed Sept. 11th, 1886; cords were about the diameter of a goose egg; scrotum was considerably swollen, but did not seem to inconvenience the animal in any respect. Could not remove the whole of the enlargements, as they extended up into the inguinal canal.

Experiment No. 9.—May 28th, 1886, castrated a grade Clydesdale colt, one year old; produced scirrhus cord on right side, which was very globular in form; scrotum and sheath were swollen some. Removed the cord September 11th, 1886, with good results.

Experiment No. 10.—June 4th, 1886, castrated a native bred one-year-old colt; produced the difficulty on the right side, which I removed on September 15th, 1886; the cord was as large as a man's fist; the sheath was somewhat swollen, but did not seem to inconvenience the colt otherwise.

Experiment No. 11.—June 4th, 1886, castrated a native-bred one-year-old colt; wounds healed up nicely. About four weeks after the operation the scrotum and sheath began to swell and reached an immense size; colt could hardly walk. My attention was called to it on July 18th, 1886. I opened the scrotum with an abscess lancet, which allowed the discharge of considerable pus; swelling went down, and wound healed again. On August 15th, 1886, I was called to attend the colt again. This time I removed an enlargement, about the size of a hen's egg, from the end of the cord; colt improved nicely after the last operation.

Experiment No. 12.—June 24th, 1886, castrated a native-bred one-year-old colt; wounds healed up nicely, and colt seemed to do well until the latter part of August, when he became unthrifty, and tucked up in the flank; scrotum and sheath swollen so badly that he did not care to move; had to be fed in stable. On Sept. 2d, 1886, I proceeded to operate on him but could discover nothing but a large abscess cavity, which I opened well, and the colt made a rapid recovery.

I would state here that in making these experiments, which were of much detriment to my local reputation, I was not blind

to the fact that it might take some time to regain my lost laurels; but, now that I am convinced of the great and only cause of these difficulties, I feel that my efforts will be more than appreciated by the veterinary profession.

THE ETIOLOGICAL MOMENT IN AMERICAN SWINE PLAGUE.

REPORT OF THE WORK DONE IN THE LABORATORY OF THE STATE UNIVERSITY OF NEBRASKA FOR THE EXPERIMENTAL STUDY OF CONTAGIOUS AND INFECTIOUS ANIMAL DISEASES.

(*Continued from page* 170).

Roloff says:

"The surface of the large intestine presents large brown-red spots in many places, in which one can see many delicate and injected-blood vessels, as well as ecchymoses of variable dimensions. Other portions of the serosa are of a diffuse red color, while others are yellowish, and still others quite pale. The serosa retains its normal lustre upon the slightly reddened, or pale portions, while it is clouded upon the brown-red parts; the latter are sclerotic."

Here comes the interesting part of Roloff's observations. He says further:

"The ileo-cœcal valve extends into the lumen of the intestine as an elongated, dense, cylindrical body. The surface of this portion of the intestine is of a leaden or slate color, its continuity being interrupted by numerous small indentations or openings of the size of a pin's head; the crown of the valve is generally ulcerated or eroded.

"The mucosa of the cœcum in the vicinity of the valve is very uneven and of a grayish-black color in many places; the same also presents many clefts in its surface. The intermediate mucosa —between these grayish-black places—is generally slate colored, clouded, and presents a very irregular surface, while some parts appear comparatively normal. The same changes are also to be found in the posterior part of the cœcum. Here one sees round or oval elevations, varying in size from that of a ten cent piece to that of a quarter of a dollar, which have a black or grayish-black

color, becoming paler towards the peripheries; their surface is marked by clefts and irregularities. Their thickness diminishes from the center towards their peripheries. The superficial tissues are very dry and firable in the middle of these objects, but become more moist and more consistent on their outer confines. Smaller and less prominent productions may be seen in the vicinity of these larger ones. These pathological productions frequently coalesce and form large pockets, or come in close proximity to one another. Their locaition upon and in the mucosa corresponds to the sclerotic, injected, and circumscribed parts of the serosa previously described."

That the above description exactly corresponds to pathological phenomena found in the large intestine in American swine plague is beyond all question.

There is no question that Roloff was probably more intimately acquainted with the lesions found in different porcine diseases in Germany than any other man that has ever written upon them.

Detmers wrote to him with reference to the above lesions in German and American swine plague and received the following answer:

"The ulcerous tumors in the cœcum and colon are not found in German swine at post-mortem examinations of hogs that have been affected with swine plague."—p. 157, Report 1880.

The question is, was Roloff right, or do they really occur in two essentially different diseases?

In a series of articles in the *Berliner Klinische Wochenschrift*, 1886, No. 44, 45,46 and 47, Hueppe (one of the most noted authors on pathogenetic micro-organism in Germany) has taken the etiology of the German swine plague into consideration and promulgated views of generalization which I can scarcely think warranted by existing facts.

The articles in question are upon the "wildseuche," a peculiar infectious disease that attacks the deer tribe and cattle and swine, under natural conditions, but not sheep, and which has been transmitted to horses and the smaller animals generally used in experimentation.

The Germans speak of the deer as "wild," and, having no

English word to express the meaning, I shall use the word "wildseuche" in the following pages. Hueppe's hypothesis with reference to the German swine plague will be found to be equally applicable to the disease in this country should his conclusions be finally supported by clinical, field and experimental evidence, which I am very much inclined to doubt.

Of the micro-etiological organism of the "wildseuche," Hueppe says:

"The bacteria appear as short rods—stabchen—in the blood, being two to three times as long as broad, and have distinctly rounded ends, markedly colored poles, and a clear uncolored middle piece; four of these objects correspond to the diameter of a red blood-cell.

"Upon cultivating this organism, in gelatine, they appear as isolated colonies, or they coalesce and form a grayish-white line, according to the quantity of material introduced on the wire. The edges of the canal are formed by the finest of isolated colonies. On the surface of the gelatine, which never becomes fluid, is formed a circumscribed growth. Their development upon agar agar is similar, the color being more of a grayish-white. Upon blood serum they form a white, transparent, opalescent coating. In boullion, a cloudiness first occurs, followed by the precipitation of the objects to the bottom of the vessel, where they form a greyish-yellow mass."

Having given the above description of the nature of the organism of the "wildseuche," Hueppe says: "I look upon the vegetative form of this organism, in cultures and in the blood, as resembling cocci, according to their stage of development, [and also as to whether one sees them end on or not—B.] they present themselves to the eye, as round, or slightly elongated, elipsoid bodies, which take up the coloring material in all parts of the body.

"This form soon extends itself to a shorter, or longer, object, with distinctly rounded ends. The plasma of these short objects differentiates within the capsule, and isolates itself at either pole before fission takes place, while the capsule still retains the form of the short rod. It finally separates into two young roundish

cells. According to the rapidity of growth and the age of the culture, numerical relations of the different morphological appearances of this organism may vary, sometimes one form and then another predominating in the cultures. I have seen the short roundish homogeneous coloring rods in the blood of animals. They do not group themselves into chains or zooglea masses.

"The vegetative form must be looked upon as the coccus form of this organism, which does not suffer any material change of definition when we now and again find a somewhat longer rod—like forms—and we must therefore credit this organism to the species micrococcus."

Hueppe's language is certainly as ambiguous and contradictory as that of the somewhat notorious Dr. Salmon with regard to the numerous objects which he has claimed to have seen and described as the cause of swine plague in this country.

To call the mature micro-organism, as described by Schuetz, Detmers and myself, a "micrococcus" because it passes through a coccoid-form in its developement, or has such a form in an embryonal condition, is as physiologically logical as it would be to call an ovum a man.

The two objects bear an equally exact relation to their respective mature forms.

In the earlier days of bacteriological research we described cocci as round, dipplo, oval, or oblong or sterpto cocci, according as they presented themselves to the eye of the observer, *but I defy any mortal human*, with honest eyes, and what is more rare, a logical and honest brain, *to make a "micrococcus" out of "bacteria which appear as short rods* [stabchen] *being two to three times as long as broad, and which markedly colored at the poles with a clear middle piece."*

It was, as has been already said, a practical stroke of genius when the greatest of all pathogenetic bacteriologists, Robert Koch, relieves us of much difficulty by classifying the micro-organisms as:

1. Cocci—Absolutely round objects—not spores—that color homogenously throughout.

2. Bacteria—Oval organisms, the logitudinal diameter of which exceeds the transverse.

3. Baccilli—rods.

4. The twisted organisms.

Now, here comes Hueppe, a most prolific author and accredited observer, and throws the whole question into such chaotic confusion, that we can no longer make ourselves understood by a single word, but must add a detailed description, in such case, in order that other observers may comprehend our meaning, especially when referring to past work.

In his opening remarks upon morphology of the micro-organism of the "wildseuche," Hueppe distinctly says that "Im Bluterscheint ein grosser Theil der Bacteria als Kurzes Stabchen, welches 2 bis 3 mal langer wie breit ist," a translation of which has been already given, but repeated reads, "in blood a greater part of the bacteria appear as short rods—stabchen—which are two to three times as long as wide."

How in the name of logical honesty, any intelligent and educated observer can transform an object "two to three times longer than wide" into a "coccus," or call it a "short rod" in one place, and then say that the same object should be called a "micrococcus," ("Wir mussen die bakterien der gattung mikrococcus zuweisen") passes my comprehension.

Hueppe certainly understands the use of his own language, and I have no very insignificant knowledge of the same, yet in either English or German it is a contradictio ad absurdum to say that a "stabchen" (a short rod) is a "micrococcus" or round object.

No person with a grain of common sense can make a micrococcus out of this object, nor would any competent observer attempt to define or classify a matured object by any intermediate stage in its existence.

It would be equally logical and scientific to call the enpupped and comatose chrysalis a butterfly!

Hueppe then gives the approximate measurements of the micro-organisms of the wildseuche, "German swine plague," and "rabbit septicæmia" and then makes (to my mind) the following absurd assertion:

"Even though I admit that the evidence is not complete, still,

so far as my conclusions can be based upon biological studies, I must conclude that the "wildseuche," "schweineseuche" and probably "rabbit septicæmia" and "hen cholera," are only differently appearing forms of one and the same infectious disease—the "wildseuche" or "septicæmia hæmorrhagica," as he technically calls it.

Admitting what I know to be a fact, that the "wildseuche" occurs in deer, cattle and swine, and at the same time admitting that it can and does occur in one or the other of these species and not necessarily in the others; admitting also that the "wildseuche" is accompanied by pneumonia and enteritis; admitting that it can be artificially transmitted to rabbit, fowl, etc., and even to horses; admitting that no essential differences exist in the morpho-biological developing phenomena between the micro-etiological organism and that of the German swine plague, still it does not justify Hueppe's conclusion that the "wildseuche" and that disease are identical, any more than it would that the "wildseuche" is identical with the American swine plague for the same reasons.

Unfortunately, or perhaps fortunately, we do not know whether we have the "wildseuche" among our deer or not, or even among our cattle and swine.

Anyone who has read my description of that singular outbreak among cattle at Crete, Neb., must certainly have become convinced that I had to do with a very wild—in the English sense—disease, also that there was not a single lesion present of either the "wildseuche" or our swine plague, yet the micro-organism previously described, found in the tissues of these animals, will fill the identical requirements of Hueppe in nearly every morpho-biological particular; but no person would think of claiming that that disease was either the "wildseuche" or swine plague. The almost absolute morpho-cultivatio-biological identity between Schuetz,s bacteria and Hueppe's "wildseuche" and that of the American swine plague cannot be denied, yet that does not prove the identity of the three diseases by any means.

Hueppe's hypothesis that the "wild" and German "schweineseuche" are identical diseases (and on his grounds the American swine plague also) shows the folly of the "simon-pure" M.Ds

entering upon questions belonging to the veterinary and comparative pathologist, and that an accurate knowledge of the course of such diseases in the hospital and the field is the essential biological point upon which the decision of such questions must depend.

In other words:

Not only must the same germs (apparently) be found in each, but the artificial inoculation of the same animals must produce the same effects, not only in susceptible animals, by inoculation, but the same course of natural infection must occur as occurs under natural conditions.

Because the smaller experimental animals are susceptible to artificial infection does not by any means necessitate that the same animals are also susceptible to natural infection or, rather, are infected under natural conditions.

That is the essential biological condition which constitutes the only quantity by which to decide such questions of identity with regard to micro-organism—*their pathogenic action.* The artificial phenomena induced must correspond in every particular, pathologically, but especially clinically, to those occurring under natural conditions.

Admitting everything Hueppe has claimed for the morpho-biological identity of his "wildseuche" bacterium with that of the German swine plague, which, as said, applies equally to the American, it does not fill the bill for the latter for the above reasons.

Hueppe says that the "wildseuche" attacks cattle, swine and deer under natural conditions, at the same time and in the same locality.

Does the German swine plague?

Does the American swine plague?

Were Hueppe here in Nebraska he could see a large drove of hogs feeding among cattle, the hogs sick with swine plague, many of them soiling the common food of both cattle and hogs with their alvine discharges; all of them lying among the corn husks and hay; the cattle continually eating fodder and corn soiled by the discharges of the diseased pigs, and kicking up a dust full of dessicated germs, and all the animals drinking polluted

water. I can assure him that he can see such cases in which 500 cattle and as many hogs are in the same field and that not an ox or steer will be sick although the hogs may be dying off at the rate of thirty or forty a day. He can also see hens, ducks, geese and turkeys eating the same food and picking over the recently fallen fœces from the diseased swine; he can see these fowl eating the bodies of deceased swine, but he would never see one die from the swine plague or hen cholera on that account.

The above facts completely knock the bottom out of Hueppe's "gruene tisch" argumentation, and sufficiently emphasizes the point I have taken, viz.: *that the identicity of all, apparently morpho-cultivation biological peculiarities in pathogenetic bacteria must be decided finally by one biological quality, viz.—the pathogenetic.*

The same disease must be produced with each and every attribute possessed by the natural diseases from which the germ in question has been procured.

REPORTS OF CASES.

JOTTINGS FROM A CASE BOOK.

By Wm. Frank Smith, M.R.C.V.S. (Lond.)

BLACK-LEG.

Black-leg, quarter-ill, or black layer was for some considerable time confounded with pure anthrax, but recent investigation has demonstrated that though a similar affection it is essentially distinct and one in which the blood contains its own individual organism or microbe. There is no more grievous disease affecting young live stock of the farm, or that is at times so productive of loss to the cattle breeder. Locality to an extent seems to favor its development in having a marked influence on the quality of the food on which such stock is fed; season of the year likewise, and other climatic conditions are important factors in its production: for instance, how often it is found that fall rains with warm days, causing a flush of luxuriant grass, or pastures which are two strong in the spring from a heavy autumn manuring,

or comparatively mild winds will originate the malady almost as soon as the young stock are placed thereon, such being far more marked with some fields than others. Too much heating corn in the winter, feeding or a sudden change from poor to rich diet, are alike important agencies in so acting on the vital fluid as to influence the production of the disorders. In what way the microbe peculiar to this affection gains ingress to the system is even now a matter of speculation, but that bacteria are present in vast numbers in the blood of those which die from the malady is clearly certain, and, further, that they speedily bring about dissolution and its attendant symptoms by rapid reproduction and growth, making war on the red corpuscles for a supply of oxygen, and by their innumerability blocking up the capillary vessels, are points more fully agreed upon. Leaving theories for fuller consideration at some future time, to meet the present demand of the farmer and stock owner, the great aim must be the prevention of the malady, and without doubt the majority of measures suitable for adoption lie in the agriculturists' own hands; in winter by a judicious feeding, sparingly using corn, alternately with hay, and not forgetting to place in the mangers the most necessary rock salt; overcrowding must likewise be avoided and sudden changes in either location or quality of pasture (particularly if rich and luxuriant at both spring and fall) carefully guarded against. Let the best doing animal of the herd be closely watched as he will be the first to go under. In event of an outbreak occurring it is not policy to strip the hide off the dead animal and blood-stain the grass for the sake of the small amount likely to be realized thereby. Not only does it contaminate the pasture, but there is the probability of earth worms appropriating bacteria and casting them up again at some future season amongst the herbage. Better to take the carcass straight away, bury it deep and cover with quick-lime. To the rest of the herd an important change of feeding should take place; in winter for a time give nothing but hay and bran, in summer put for some days on the scantiest pasture and gradually change back, seeing, meanwhile, that they have pure water. A mild aperient dose all around, should be given, followed by the use of hyposulphite of soda, care

being taken that each animal has his daily dose, and its administration continued for some weeks if there appears any danger of the others falling down. Also insert a seton tape dressed with some suitable digestive in the dewlap and have it frequently drawn to and fro to keep up an irritation and discharge.

It is only by following closely such a line of treatment that we can hope to eliminate the morbific material accumulating in the blood and again place the young herd on a healthy footing. It is almost yet premature to conjecture on the value of a protective inoculation derived from the intra-venous injection of muscle-juice virus; on thought there is a good deal in it, and experiments made under the auspices of the Royal Agricultural Society of England appear to yield such results as will probably on further pursuit demonstrate it efficacy and practicability. This letter is a special subject of which more anon.

AMPUTATION OF A CAT'S LEG.

It is just possible that amputation of injured limbs, though occasionally practiced in veterinary surgery, are not so often resorted to as might be the case, in order to prolong the life of a favorite pet, or still retain some special strain of blood particularly adapted for breeding purposes. Veterinary records, it is true, furnish us a few successful instances, but it is unhesitatingly asserted such might be further increased, did but the majority of practitioners still continue to study their anatomy after college days are past, and apply the same more fully in the every day routine of business. Fractured limbs I have had to treat in great numbers, some successfully, in others—from peculiarity or nature of fracture, excitability or like disposition, or age of the patient—with a contrary effect, but the only case in which amputation was called for yielded such an excellent result as to induce me to place it on record. During the time I was managing assistant to Professor Pritchard, the great veterinary pathologist of London, in his absence I was consulted by a gentleman in regard to a large favorite long-haired cat which unfortunately had its leg injured in a trap. I found the limb—the left fore—from above the carpus downwards to be completely smashed, discharging an offensive matter which clotted in with the hair, and apparently

mortifying away. The injury had then been inflicted about a fortnight; the cat seemed in great pain, in consequence of the gangrenous state of the limb, was very feverish, and had wasted considerably. After a careful examination I concluded that nothing short of amputating the limb would save the animal's life. Accordingly next day, aided by an assistant, I placed the cat under chloroform and proceeded to operate, firstly placing a torniquet tightly round the limb immediately under the elbow joint. Half an inch above the fracture, on both inside and outside of the radius, I passed a scalpel, cutting outwards, and downwards, dividing all structures from the bones outwards and then with a fine small saw completed the amputation. I next ligatured the radial artery, wrapped the severed ends of muscles over the stumps of bones left and finished my operation by approximating the edges of skin over the lot and there maintaining them with two sutures. A dash of cold water then revive the patient and he was kept in close quarters with light food for three or four days. At the end of that time I examined the stump of limb, found that healing of a healthy nature was taking place and removed the sutures. The cat was then allowed to roam about as he pleased and speedily accommodated himself to progression on three legs. I troubled no more with the case for some weeks, when I found sound healing had quite taken place, leaving only a small cicatrix where the skin had been sutured over the stump. The cat had again got very fat, trotted about the house with no difficulty and had been even attempting to catch mice.

AN INTERESTING CASE.

By W. P. Robins, V.S.

I take the liberty of again sending you an interesting case which occurred in my practice here and which may be instructive.

About a month ago I was called by telegram to a small town west of this place to see a horse, which I found had been suffering from an unaccountable malady for nearly two days. The first

symptom noticed by the owner was observed after the horse, an old bay mare, had eaten a little of her feed with her usual appetite, when she suddenly stopped eating and refused water. A few hours after that she commenced vomiting; there was considerable retching and about a teacupful of healthy pus was raised several times in succession. The pus was creamy, not bad smelling, but streaked with a very little blood and accompanied by a very little chewed up hay and oats. Next day the vomiting had disappeared, but still the animal could not drink, although she tried frequently. It was the next morning I saw her. Her flanks were drawn up and hollow; tried to eat a mouthful of hay but swallowing gave great pain and she took a drink of water which was followed by violent retching and the return of the water and hay and a little clear mucous *through the mouth.* The œsophagus was much swollen and somewhat tender. I observed two or three "horse doctor books" lying about and a full compliment of blacksmiths and livery men, so enquired what had beeen given to the mare, and was told "Only a little kerosene; I thought it might kind of oil up the swallowing part." Kerosene had also been applied on the outside of the neck. I diagnosed abscess of the cardiac end of stomach resulting in œsophagitis. I administered half drachm doses of bellad. s. ext. and had the neck bathed with warm water every hour, followed by a liniment of camph., aconite, chloroform and alcohol. In two hours the swelling appeared to decrease and the animal was much easier. Next day she took a little soft feed, in two days more she was eating full rations, but was kept on the soft feed for a week when she was, apparently, completely cured.

REPRINTS FROM BRITISH AND AMERICAN JOURNALS.

OSTEOPOROSIS.

By J. A. Smith, M.R.C.V.S.

The following short history of a case of osteoporosis may prove of interest as being, I believe, the first recorded in this

country. The subject was a thoroughbred brown Australian gelding, by "Gondalier" out of "Touchstone" mare, imported in August, 1883, from Gippsland, Victoria, where he was bred. He was admitted into hospital on the 7th February of this year, aged seven years off.

The symptoms at first exhibited were as follows: sudden and extreme lameness in the near fore leg, which within twenty-four hours extended to the off fore. A careful examination revealed nothing to account for this, beyond a slight tenderness about the fetlock joints. There was no swelling and no perceptible heat, the internal temperature being also normal. At this stage I diagnosed the case as a rheumatoid affection of the joints and treated accordingly. Fomentations afforded marked relief, and the animal gradually improved, until on the 27th of February he was able to perform a fair trot, when his owner removed him to his own stable. On the 9th of March I was again asked to see him, as his "head had become swollen" and he was "off his feed" (his appetite had previously been good). It was now an unmistakable case of "osteoporosis." The raim of the lower jaw were thickened and tender when touched. The face had an undefined and rounded appearance and the incisor teeth were quite loose. The lameness had entirely disappeared. I recommended the owner to have him destroyed and this was carried out on the 17th of March by pithing. The fore legs were carefully examined to discover the cause of the severe lameness previously mentioned, but without result, he bones appearing quite healthy and free from disease; the bones of the skull alone being implicated.

The horse since his arrival had been staying with a large number of others at Ballyguage, the food and general conditions under which they lived being precisely similar.

It would seem that the disease in this case was entirely due to some original inherent influence interfering with the nutrition of the bone tissue. Diet and surroundings would appear to have had little to do with it and the animal's parentage seems good enough to controvert any suggestion of hereditary predisposition. —(*Quart. Jour. Veterinary Science in India.*)

INTERNAL HÆMORRHAGE FROM CASTRATION AS A CAUSE OF DEATH.

By J. H. Steel, V.S.

One of a number of cast ponies (castrated, under orders, before sale to the public as quite unfit for army transport) had been operated on by the scraping method, by one of the senior students of the Army Veterinary School; several beds were "going" simultaneously under my supervision, so I did not observe if this animal was "scraped" with sufficient deliberation or if undue tension was put on the cords. He seemed to receive exactly the same attention as the other fifteen castrated on this bed on the same morning. The operator, an artillery shoeing-smith, had frequently castrated before. In three hours time the little animal was reported dead. There had been no external hemorrhage and he had shown no signs of discomfort sufficient to attract the attention of the European Warrant Officer in charge, an experienced transport official. As the ponies of this transport had been dying suddenly from Surra, the pony was considered possibly a victim to that insidious disease; however, a post-mortem examination showed the peritoneal sac occupied by a recent blood colt moulded into form as it were by the abdominal viscera. The cords seemed quite healthy, but one of them had been cut off too short.

Remarks. Although cases of external hemorrhage are not at all rare, I have no previous record of internal hemorrhage following castration quite unaccompanied by any external indication of blood-flow. The actual loss of blood here was inconsiderable (unless much had been re-absorbed before post-mortem examination), quite insufficient to have caused death had it escaped externally. —(*Ibid.*)

COMPLICATED SPLENIC DISORDERS.

By Sorabji K. Nariman, B.Sc., L.M. and S.

A gray entire ghari horse, much overworked and in extreme poor condition, the result of obscure disease of long standing. The animal was admitted on the 12th of October, 1886, a little off feed, with fever and occasional cough. Pulse weak and about

50 per minute; ribs prominent, and intercostal muscles drawn in or atrophied; respiration frequent. Auscultation showed harsh sound at bases of the lungs. Temperature 100° F. Received a tonic ball 13th. Pulse 56, weak—cough slight; temperature int. 102° F. Tonic dose 14th. Eats less, no lesions detectible on examination of the mouth—temperature 100–8° F. Tonic 15th. Almost constantly lies down; very depressed; eats very little food; pulse very weak and frequent; a stimulent given. Early in the morning of the 16th was found scarcely able to rise. Died at 8:30 A. M. Autopsy, about two hours after death, showed the liver twenty-two pounds in weight, studded throughout with grithy particles varying in size from a pin's point to a small pea, here and there a small amount of lymph of a bright green mottled color on the surface-section. Omentum enormously congested. Stomach much congested throughout its villous portion and having the remains of one parasite cyst. Gastro-splenic omentum a perfect mass of small abscesses; spleen nineteen and one-half pounds in weight, perfectly full of abscesses except at its base, edges and apex. Heart, weight seventy-three pounds, its substance very fatty, an extensive collection of rather solid looking gelatinous lymph and blood in the furrows. Considerable extravasation beneath the endocardium of the left side and very slightly of the right. Lungs congested throughout the posterior two-thirds. Emphysema at the margin of the left lung. Here and there a considerable deposit of lymph in the substance of the pleuro-pulmonalis, a few round gretty particles in the lung suhstance like those found in the liver. There was a considerable amount of yellow fluid in the cavity of the belly and a great deal of recent lymph on those parts of the bowels which lie against the spleen. —*(Ibid.)*

CHRONIC LIVER DISEASE.

By Sorabji K. Nariman, B.Sc., L.M. and S.

The patient, a bay entire ghari horse, was admitted into hospital on the 3d of July, 1886, with œdema of all four legs and tenderness of the frogs. Visible mucous membranes congested

and with slight yellowish tinge; pulse frequent and weak. Nitre and sal ammoniac in four drachm doses given in drink. Frogs dressed with carbolized tar. Patient at first improved somewhat but the œdema did not subside. He then became much weaker. On the 26th he was very feverish and refused his feed; temperature 100–8°; pulse 65; visible mucous membrane yellowish. The symptoms became less marked on the following day and under the influence of extra exercise, laxative diet, and "liver balls," a relapse took place on the 28th. Temperature, 101–8° F.; pulse 48; respiration 36, hurried and short; febrifuge medicine with tonics given. On the 30th the temperature rose to 103–5°; pulse 54; he lay down a good deal this day and at times seemed restless. Breathing very quick. On the 31st the patient seemed too weak to walk, but took food well; temperature 102–5°F.; pulse 60; at 12:30 noon, he fell and was unable to rise; at 1 P. M. he vomited. At 2 P. M. he rose; there was noticed much froth at his mouth, the urine trickled from him drop by drop; the abdomen seemed very full, especially the gastric region. He lay down again and showed symptoms of not very acute abdominal pain. At 2:30 P. M. there was twitching of the voluntary muscles, he perspired profusely, head hung down, anxious appearance, action of the heart extremely violent, urine trickling drop by drop from the penis, which was somewhat protruded.

A draught of water caused more labored breathing with slight expulsion of gas per anum. Opiates and other anti-spasmodics enemata, and mustard applications were freely resorted to throughout the case. Rupture of the stomach was diagnosed. Exploration per rectum failed to detect any abnormality and the bladder was not full, but a small amount of urine was expelled on pressure over the organ. At first the bowel was found dilated and a small amount of soft fæces was removed; later it was forcibly contracted and a little blood remained on the fingers on withdrawal. The animal lay down during this latter exploration and expelled a little gas after the passage of the dung. Pulse more distinct but very quick. Extremities warm. At 6 P. M. extremities cold, patient down, extremely restless, bathed in perspiration with most extraordinary dilatation of the superficial veins. Opi-

ates continued, to save the animal as much pain as possible. 9 P. M. tried to get up but each time fell down again; breathing very quick and labored. 10 P. M., died, after a short struggle. Autopsy (12 hours afterwards) showed blood clots in the heart; lungs congested, especially at their bases; stomach large, full of food, no rupture of its walls; bowels slightly congested in parts; spleen normal. Liver of enormous size and in a state of fatty degeneration. Other organs healthy.

Remarks.—A most unsatisfactory post-mortem. Quite insufficient to explain the symptoms. It is considered the vomition must have depended on gastric dilatation with extreme expansion of the cardia. There could be no mistake as to expulsion of food material through the nostrils. In so advanced a disease of the liver it is most extraordinary that the spleen showed no traces whatever of enlargement or disease.—(*Ibid.*)

HÆMATOCELE.

By T. Marriott, V.S.

A chestnut, entire, Persian horse, 4 years old, disembarked from the B. I. S. S. "Pemba" late on the previous evening apparently suffering from scrotal hernia.

Examination per rectum revealed both inguinal rings to be clear, and on manipulation of the scrotum a quantity of fluid was detected. The animal appeared very stiff and could scarcely walk, so evacuation of the fluid became imperative. Puncture of the right sac with a fine needle allowed the escape of a little decomposed blood, and on enlarging the orifice eight ounces of coagulated blood, very dark colored and mixed with serum, escaped. Antiseptic dressing was applied and rapid recovery followed.

December 6th. Animal going sound, swelling had subsided, leaving a little induration of the scrotal tunics, which disappeared before he was sent to his regiment, and the right testicle had become so atrophied that only a mere trace of it could be detected. This I think proves that the hæmorrhage was from the testicle, probably due to an injury on board ship.—(*Ibidem.*)

COMPOUND FRACTURE OF THE NEAR TIBIA OF A WALER MARE IN D/2 ROYAL ARTILLERY, AHMEDABAD.

By J. A. Meredith, V.S., A.V.D.

The history of the case, as follows, was given by the sergeant farrier of the battery, 12th of June, 1887.

Wound contused, the result of a kick from another horse after watering parade, and during the act of securing the animal in the lines. The blow was heard a distance of sixty yards. On the following day the mare was exceedingly lame, leg swollen, great pain. Treatment; fomentations and astringent lotion. Up to 18th, the treatment was continued, unable to bear any weight upon the limb. 26th, I had but recently arrived from Quetta to Deesa and making my first bi-monthly inspection to Ahmedabad, on this day I examined the mare for the first time and came to the conclusion that the injury was extensive, and that a fracture existed, but was of opinion that recovery was not impossible. I had the mare placed in slings, and applied a starch bandage to the leg, taking care to keep the wound free from the bandage. The off hind limb was very much enlarged from bearing the weight. Pulse 58, temperature 99–8°. Respiration, little excited. Next day she looked cheerful, temperature normal and pulse 54, eating fairly well, bowels regular.

The mare appeared to be in a fair way toward recovery. 29th.—Considered her in such a condition that I returned to Deesa, having left instructions to keep the mare in slings, give plenty of green food and for the administration of salines daily. 30th.—The sergeant-farrier's record of the case continues thus :—Pulse 54, temperature 99.6°. 2d July—Pulse 56, temperature 100°; galls being severe from slings, she was removed therefrom and allowed to remain down 15 hours. Pulse 60, temperature 100°, eating little, no improvement took place and on the 8th she, being much about the same, was allowed to remain down instead of placing her in slings. The bed sores increased and the mare appeared worse, elevation of temperature and pulse, refuses food, so on the 13th I was again telegraphed for. 14th.—I arrived and having examined the mare, found her much worse, feverish, re-

fusing food, limb very much enlarged, pulse 95, temperature 102.2°. I considered the case hopeless but repeated doses of tinc. aconite (Fleming). 10 miniums were given. 15th.—Exhibiting great pain, mare worse, sedatives continued. 16th.—Mare sinking fast; applied for a station board to assemble and they considered the mare should be destroyed, which was done at once, at 2 P. M.

Post-mortem.—The internal organs healthy; the near tibia was fractured for near 10 inches, running in a longitudinal direction from two inches above the seat of injury and finally with dividing posteriorly, great deposit of permanent callus up to line of fracture. [This specimen as presented to the Museum of the Bombay Veterinary College by Mr. Meredith, is the most remarkable one of fracture of tibia we have ever seen; a spiral crack runs round a considerable part of the bone, and callus has been thrown out everywhere over the surface (where the pericosteum extends) of ejection as sequestra, but had cure occurred the tibia must have remained enormously and permanently thickened.]—(*Ibidem.*)

UNUSUAL RESULTS OF CASTRATION.

By V. S. Gerald H. Fenton, F.R.V.S.. Army Veterinary Dept., Kamptee, India.

From the peculiar circumstances which have occurred during the past three months in the cases of some recently castrated horses, I am induced to record the same, never having experienced these conditions in my practice before these cases happened in the 4th "P. W. O." Madras Light Cavalry, amongst the Persian remounts, 145 of which have been castrated here, an unusually large number for one regiment. I am particularly referring to laminitis as a peculiar sequel of castration. About twenty-five out of this number, after being castrated from five to ten days, were reported as not being able to take their usual gentle exercise owing to fever in the feet. These symptoms varied very much in intensity in the different cases. In some instances both fore feet were affected and not the hind; in others one fore, and in the

worst form, all four feet, and to such a degree that the poor animals could not stand up. The symptoms, however, in several cases did not last more than five days, when the patients were able to resume their exercise. The usual treatment of poultices and wet swabs in the less severe cases was adopted; in the serious cases, when the patients could not stand, an addition to the above treatment, refrigerating lotions of an evaporating nature were applied to the limbs with very much benefit; there were no bad results after these cases.

The next case is one of peritonitis, which is not at all unusual as an after effect of castration; but in this instance it was surprising to say the least of it. I herewith quote the case:

Peritonitis.—The patient is a remount, and was castrated nine days ago, and progressing most favorably. The animal went through his food the evening previous, and showed no signs or symptoms of sickness of any sort; but at 5:30 A. M. he laid down, struggled for a few minutes and died. No treatment. Post-mortem revealed most extensive peritonitis, visceral and parietal, and extending to the pleura in thoracic cavity. There was about one gallon and a half of fluid in the abdominal cavity, which no doubt prevented the usual symptoms of peritonitis being observed. There was lymphadenoma of the spleen well marked; the right ventricle of the heart was gorged with tar-like blood. Lungs and kidneys healthy. Discharged; died.

The following case, also taken from the record of treatment, is worthy of note, there being no cases of paralysis, general or local, in the horses of the regiment. At the same time, I do not wish it to be inferred that I am positively stating that the castration had anything to do with it; but there the fact remains, that the paralysis appeared without any traceable cause, and as paralysis is a nervous affection, there is no reason in my mind why it should not occur as a sequel in the same manner as tetanus, mysterious though it may be.

March 16th, 1887, Paralysis, local, (labiæ).—The patient was recovering from castration, and almost fit to be discharged, when the lips were noticed to be in a pendulous condition, and he was with difficulty able to feed, although appetite very good. Inject

liq. strychniæ above upper lip, and give liq. strychniæ ℥ ii, aqua ℥ iv, in a draught twice a day, and plenty of sloppy diet.

March 20th, the lips are more pendulent, and the patient is quite unable to feed without assistance, the food being put into his mouth. He seems much distressed. Continue the draught and assist the animal as much as possible by continued small feeds.

March 25th, no improvement, and the animal is getting weaker and weaker. Try the galvanic battery three or four times a day locally.

March 27th, treatment of no avail. Patient rapidly losing. Give tonics and stimulants three times a day.

April 1st, the patient weaker. Prognosis unfavorable; continue treatment.

April 11th, worse. All the tonic, stimulent, and nursing treatment of no avail; can do no more. Apply for a special casting committee to have him destroyed.

April 12th, the patient died before the committee was convened. Post-mortem revealed all organs healthy, but very anæmic. Discharged; died.—(*Ibidem.*)

FRACTURE OF RADIUS IN A BROOD-MARE—AMPUTATION AND RECOVERY.

By Prof. R. S. Huidekoper, M.D., V.S.

On April 3rd I was called to the country to see a brood-mare with a fractured forearm, and found the following interesting case, which demonstrates the fallacy of the rapid unfavorable prognosis and slaughter which usually takes place when a valuable breeding animal breaks its leg. April 3rd, 11 P. M., gray mare, 15–1, 10 years old, within six weeks of foaling, having been covered in June last by a valuable horse. The mare had been turned into the barn-yard the morning before, and was found in a half hour with a fractured forearm. She was standing in rude slings, which pressed too much on the abdomen, and rendered her very uncomfortable. The off front leg was encased in a splint which had been admirably applied by the family physician. On removing the splint I found a compound comminu-

ted fracture of the lower end of the radius. The leg was considerably swollen and very painful. On attempting to examine the fracture the mare reared, dropped backward from the slings on to her sound side, from which it was impossible to raise her, as all but one attendant declined positively to see the animal suffer. I reapplied the splint, and early the following morning reported to the owner that the only possible means of saving the foal would be amputation. April 4th, 8 A. M.—Mare on near side, nervous and suffering greatly; has been sweating constantly through the night. Straining somewhat, but movements of fœtus can be felt. Hobbled hind legs and near (under) foreleg with ordinary barn rope: had head restrained by bridle and twitch. Made rapid circular operation in middle of forearm, cutting the skin and subcutaneous tissue in first sweep, the superficial layer muscles in second, and with the third, cut the deeper muscles to the bone, sawed the bone with a saw borrowed from the farm kitchen, which was previously flamed to cleanse it. Was only obliged to ligate the anterior and posterior radial arteries, the remaining hæmorrhage answering promptly to cold water rendered antiseptic by the addition of a small quantity of bichloride of mercury. United soft parts by two deep sutures leaving drainage at corners. Lifted mare to her feet and placed a loose narrow sling under thorax. In an hour the mare had cooled from her sweating, was much less nervous, and ate a handful of oats, drank water and picked at a bundle of hay. A great deal of trembling continued in the near foreleg from the strain imposed upon it, as the animal declined to give herself much support from the hind legs. Left orders that the slings should be removed at night and the mare turned loose in her box stall. During the following three weeks the animal was let down at night, and supported with slings in the day time. Once or twice she was allowed to remain on her side for more than a day, and swelled a good deal in the mammæ and gentils.

April 24th, 10 P. M.—Found wound almost healed, but muscles considerably contracted, allowing protrusion of bone which is, however, covered with a dense fibrous tissue. Find that animal has been constantly in slings during the day time, and

that she depends on them, throwing the entire weight of the anterior part of the body into the canvas, instead of using her leg. Find also that she has given great trouble in having to be lifted to her feet each morning. Removed slings, in which mare was falling asleep. After several attempts she got down, showing, however, a great deal of caution for the amputated leg. In a few moments she was sound asleep.

April 25th.—Animal on side, bright; lifted head on our entrance into the stall, got herself ready to be lifted up, but refused to give any aid. Placed a bridle on her, struck her suddenly with a whip and she got up without aid. Walked her into barnyard and turned her loose. On May 1st she foaled without trouble, and is now at pasture with a healthy foal beside her. Before foaling the mare used her hind legs but little for support, but since she no longer has to protect the abdomen, she has assumed more the gait of a foundered horse. The long stump of bone was obligatory on account of the awkward saw, which was the only one on hand; constant irrigation was not possible, but the animal received frequent bathing and excellent nursing.

In the above case the pregnancy proved a serious complication, but the animal fortunately had great courage. In future cases, I would advise but little use of slings, as the animal should learn to depend upon itself at once. In the case of a valuable breeding animal, amputation is certainly no more serious than a severe quittor or pricked foot.—(*Jour. of Com. Med.*)

MELANOSIS IN A BULLOCK.

By E. Wallis Hoare, M.R.C.V.S., Cork.

The subject was a three-year-old bullock, color brown, marked with white, rather poor in condition, presenting a large tumor surrounding the base of the ear, which the owner requested me to remove. The history given was, that about a year ago a small enlargement was noticed in this region, which gradually increased in size until it attained its present enormous proportions. The tumor was round in shape, and its base was narrow in comparison to its size, but quite broad enough to give suspicions of a large

vascular supply. It was hard and firm in consistence, except at its extreme lower part, which was becoming soft and very fœtid. The animal was cast, and as the base of the tumor was too broad and tough for excision by the chain ecraseur, and a wire one not being at hand, it was dissected out with a scalpel, and the hæmorrhage from the external smaller blood-vessels arrested by the actual cautery; and, as the ear was completely involved in the diseased process, it was necessary to remove that organ in connection with the tumor.

In the center of the tumor some very large blood-vessels were found, which required the application of the ligature, and, as proper assistance was not at hand, this was no easy matter.

The tumor, when removed, weighed 30 lbs., and on being cut into, was very firm in consistence, except at its lower part, which was soft, and from which a quantity of dark colored fœtid fluid escaped.

The color of the tumor was deep black, and on section a marbled appearance was presented. Portions placed in water in a very short time colored it a deep black. The case up to the present is doing well, and as there are no other external manifestations of the disease, and the animal appears healthy in other respects, there is a chance of the operation being successful, but the recurrent nature of this affection makes its treatment unsatisfactory. I may state that the wound was dressed with antiseptic dressings, in the ordinary manner. A portion of the tumor was forwarded to Professor Williams, New Veterinary College, Edinburgh, who kindly examined it microscopically and pronounced it to be melanosis.—(*Vet. Journal.*)

A CASE OF EXTENSIVE RUPTURE OF THE ŒSOPHAGUS.

By James B. Gresswell, Louth, Author of the Manual of the Theory and Practice of Equine Medicine, Etc.

Quite recently in the evening I was called by a well-known breeder of short-horned stock to see a valuable heifer, belonging to a superior breed. The animal had been observed by the attendants to be choking in the afternoon about 2 P. M. The

owner's son, seeing the predicament in which the animal was, then had the boldness to pass the probang.

I arrived on the farm at 9.30 P. M., and the most prominent feature which at once attracted my attention was the enormous tympany of the rumen. The pulse was not more than 78 per minute; the respirations were labored, varying in number in successive minutes. The animal occasionally grunted and showed signs of acute pain. On the near side I observed great swelling of the neck. The owner's son, on being questioned as to whether he had experienced any difficulty in passing the probang, replied in the negative, and added that the animal had since swallowed oil. I diagnosed the swelling as being due to laceration of the œsophageal walls, and fomentations were accordingly applied to the swollen parts. A fine trochar was passed into the rumen, and the gaseous matter drawn off. The relief was immediate, and up to 2.30 A. M. the animal did well, when it suddenly fell dead without a groan. I should add that the animal had taken small quantities of water in addition to the oil, after the probang was passed.

On the next day a careful post-mortem examination revealed an extensive rupture of the œsophagus nine inches in length; the walls were seen to be infiltrated with a gelatanoid exudate, and there was also much material effused into the tissues of the neck.—(*Veterinarian.*)

CORRESPONDENCE.

A FAITHFUL TRANSCRIPTION.

To the Editor of the Veterinary Review:

In perusing the *American Veterinary Review* for July, I was fairly puzzled when I came to page 170, on which begins an article on "The Veterinarian as a Member of Society," by D. P. Yonkerman, of Cleveland, Ohio. I was certain I had read something like it before—nay, that it was more than usually familiar to me. Being from home at the time, I could not assure myself

as to the paternity of the different paragraphs and sentences, nor exactly as to where I should find them in my library on my return home.

I have now to acknowledge the honor Mr. Yonkerman has done me in making a most faithful transcript from Vol. I. of my "Veterinary Sanitary Science and Police" of those portions which go to make up his "member of society"; though in that work these portions do not all follow in the sequence in which he presents them to your readers. They are somewhat promiscuously selected, but they will all be found on the following pages of the work, if anyone is desirous of ascertaining how exactly they are copied, viz.: pp. 1, 19, 21, 23–24, 193–195, 297, 299–303.

There is only one oversight which the writer may be charged with in compiling his article: he has omitted to give the title of the work which he has so usefully consulted. That omission, I hope, this allusion to it may repair.

Yours truly, GEORGE FLEMING.

LONDON, August 2d.

VETERINARY LEGISLATION.

Editor Review:

For the last two years or more many of the pages of the REVIEW have been devoted to the subject of Veterinary Protection and Legislation, not only here but in England as well.

While it has been quite entertaining, it is not at all instructive. It looks to me as though a few wanted to get a little cheap notoriety by being brought prominently before the public as promoters of this protection and legislation.

I would like te ask what the profession wants of protection. Is it to protect a few men who have attended this or that institution, that teaches veterinary medicine, grants diplomas to men who pass an examination, etc. ?

They want to be protected by legislation, so that Mr. Jones, who has not attended such an institution, cannot practice.

It seems to me the best way for the so-called Regulars to protect themselves is to show by their ability and skill that they

are superior to the so-called Irregulars, who are practicing without the highly prized diploma; then they will be protected by their own ability.

I would like to ask if there are not as good practitioners and operators that have no diplomas as there are that have.

I think the way for the so-called Regulars, no matter from what school, country or college, either from this side or the other of the Atlantic, to protect themselves is by being united, and not try to hurt a brother practitioner that is in the same town or city with him. Protect each other by lending a helping hand, if need be, and not give each other a back cut whenever the opportunity occurs.

Every man has his opinion and a right to express it, so long as it is not detrimental to his neighbors. We do not all think alike.

Is it not better to have no legislation at all than to have a law by which any hostler, groom, coachman or blacksmith can register and be on an equal footing with your honored self, so far as the law is concerned?

This leads to another question, that of the curriculum of study in the different schools not being of a uniform standard. Will it ever be so?

I do not believe it ever will, as most of the schools, so far as I know, are private ventures, though they may be connected with some high toned university—and as such, every one tries to get out the most students and graduates. What is the result? that in order to make it a paying investment the curriculum is shortened, and out of the list of graduates turned out many of them cannot apply a bandage on a horse's leg.

One of these graduates settles in a town where a so-called quack has been for years; this quack is a man of close observation, long experience, a student well posted in veterinary and medical literature, a good practitioner and as a man above reproach and of good character. The graduate, after getting settled in his office, first of all goes to work to impress on the public mind that Mr. Quack is a quack; then he looks to the Legislature for protection, to prevent Mr. Q. from earning his living. Now,

why, if he is so much superior to this quack, does he want protection?

It has been my good fortune to have several such quacks for my personal friends, and I do not know if I would not wish that we had more of their kind amongst us.

I believe too much is thought of in the word regular. Instead of depending on legislation, let us confine ourselves to the legitimate practice of our profession, let us avoid jockeyism, horse dealings, etc., let us remember that all the various duties of the veterinarian are duties of trust in every sense of the word, let us be honest and true in the performance of the same, let us avoid petty jealousies and treat each other in the most professional and brotherly manner possible, and then we can be sure that we will want no legislative protection; we can be certain that the public itself will protect and soon recognize us as worthy members of a profession second to none.

C. H. Peabody, D.V.S.

PRACTICE FOR SALE.

Connellsville, Pa., Aug. 22d, 1887.

Mr. Editor:—I have made up my mind to go West on account of my health, and will dispose of my practice and instruments, also a very fine match driving team with good rigs. The practice is worth $2,000 to $2,500 per year. No opposition. Center of the coke region. Will sell out entire and recommend a good man, for $1,500 cash. Anyone wishing to purchase can examine books and stock. Team cheap at $500. If you know of anyone that can fill the place and has the cash, I will be obliged to you for the information.

Yours respectfully, E. Lansford.

INQUIRY AS TO AN ADVERTISEMENT.

[The following has been received in answer to the advertisement issued in August number. The advertiser will please notice and answer.—Ed.]

Maynard's Stables, Bowdoin Square,
Boston, Sept. 8, 1887.

Sir:—Having seen your advertisement in the American Vet-

ERINARY REVIEW, shall be glad if you will give me full particulars of practice, etc., amount of purchase money, and what introduction will be given.

Yours faithfully,

W. H. BARTRUM, M.R.C.V.S.L.

REVIEW.

FARMER'S VETERINARY ADVISER. By Prof. JAMES LAW, of Cornell University. Eighth Edition. Published by the Author. Ithaca, N. Y.

It is but a few years since Prof. Law issued under the form of a small book his *Veterinary Adviser*, and to-day we have the pleasure to notice the eighth edition of the same work, revised and considerably enlarged. This fact is of itself sufficient evidence of the appreciation of the work by the public at large, and we have no doubt also by the veterinary profession, and of its importance as a book of great value to those for whom it is written.

This last edition contains much added material, and amongst all the new written pages is Chapter 11, where under the modest title of Contagious and Epizootic Diseases, is found a short work on bacteriology and on the *to-day* interesting success of prophylaxy by inoculation.

The subject of parasitic diseases, of skin affections, with those of the various apparatuses of the body, including those of the functions of locomotion, are treated more extensively than in previous editions, and the special addition of the long article on contagious pleuro-pneumonia with which the author is so familiar, all undoubtedly contribute to render the *Adviser* a most valuable work to the farmer, to the veterinary student and to the busy practitioner.

THE REINS AND THE WHIP.

We have received a copy of the new monthly and we are well pleased with its appearance. It is a large illustrated magazine which intends to give general information to all those that are interested in horses and dogs. This number contains some excellent illustrations and the reading of the various articles is quite interesting. We wish *Reins and Whip* good success.

AMERICAN VETERINARY REVIEW,

OCTOBER, 1887.

EDITORIAL.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.—The twenty-fourth annual meeting—quite a large attendance from various parts of the country—the failure of good useful work—"Nothing, absolutely nothing was done"—failure of the committee to report—that of the Committee on Prizes, declining to grant the prize, accepted—vote reconsidered and the prize given to the paper bearing the signature of "Trianon"—vote irregular and unconstitutional—The REVIEW cannot coincide in the decision, and withholds its addition to the prize of the Association—papers prepared for the meeting not brought to light—election of new officers good—their responsibility great—danger to the life of the Association. INTERNATIONAL MEDICAL CONGRESS.—Could an International Veterinary Congress be held in the United States?—Necessity for American graduates to be appointed and to attend the next Congress in Paris in 1887—Recognition of the veterinary profession in the Washington Assembly—Dr. Trumbower's letter—A good example to be followed by other medical bodies. PROF. PAQUIN'S LETTER —Our correction as to the assistance given by Missouri to advance the veterinary profession. DIRECTOR NOCARD OF THE ALFORT SCHOOL—It means progress and a new impulse to the cause of veterinary science in France. GOOD EXAMPLE FROM AMERICA FOLLOWED IN EUROPE.—The Berlin Veterinary School elevated to the rank of University—This already done in the United States. AGE TELLING IN OLD ANIMALS.—Dr. Miller's letter—Apparent disagreement amongst veterinarians. VETERINARY HONORS.—Prof. R. S. Huidekoper receives the title of Honorary Associate of the Royal College of Veterinary Surgeons.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.—Pursuant to notice, the twenty-fourth annual meeting of the United States Veterinary Medical Association was held on the 20th of September. A total of nearly fifty members responded to their names, including veterinarians from New York, New Jersey, Con-

necticut, Maryland, Massachusetts, Pennsylvania, Ohio and other states. Numerically it was a very respectable gathering, yet, when we examine the record of proceedings, as prepared by the Secretary, and which we print in this number of the REVIEW, we regret that it is our duty to say that, although it makes very good reading, it contains no reference to any good work or important discussion to distinguish honorably the results accomplished by the meeting. In fact, to repeat the words which convey the impressions of many of the members present, "nothing, absolutely nothing, was done."

The committees, one and all, with perhaps a single exception, failed to report anything of value, while others were content obligingly to "report progress," which being rightly defined means the negation of action, or "stationary motion." There was, however, one thing curiously and peculiarly notable accomplished by this meeting. We refer to the action deliberately ignoring, or rather studiously overruling the report of the Committee on Prizes, by the passage of the unconstitutional vote by which the Association accorded a prize to the author of a paper which had been returned with an adverse report by the Committee of Adjudication, which had been authorized and empowered to determine the merit of the treatise.

Two papers had been presented—one was considered an excellent compilation and nothing more—the other, though possessing some claims to originality, not being deemed of sufficient value or literary quality to justify such a sanction and endorsement of the Association as would be expressed by the bestowal of the prize.

The Committee reported to this effect, and the report was accepted by a vote of the Association, but only to be followed by a second resolution, reversing the first and putting a negative upon the entire former proceedings. All this occurred during the absence of the committee from the room, and consequently, their inability to defend their decision. The result is that by an unconstitutional vote, the Association prize has been awarded to a paper bearing the signature of Trianon.

We say the vote in question is in violation of the Constitution

of the Association. The words of Article 10, Chapter VII., of that instrument are:

ART. 10. It shall be the duty of the Prize Committee to examine all essays presented to them and to award the prizes, if the papers are, in their judgment, worthy the same.

In respect to this action of the Association the REVIEW, strictly speaking, has nothing to say, though, of course, not entirely an unconcerned party in the matter, so long as the prize offered by our staff mutually with the Association, refers to the same paper. But the REVIEW cannot remain blind to the error that has been committed, nor to the unjust treatment of the Committee on Prizes, and though, not without feeling much regret at the necessity of doing so, feels constrained to announce its intention of withholding its addition to the prize of the Association, at least until further consideration of the subject.

The greater part of the afternoon session was occupied in the discussion of this subject, and papers which had been expected, and which had been prepared and were in readiness for presentation to the meeting, were left on the table or in the hands of their authors. An excellent appeal in favor of the reorganization of the Army Veterinary Service was entirely ignored. The paper on Contagious Fever of Horses, by the President, was not brought to light, and after an unprofitable and insignificant discussion on the nature of cerebro-spinal meningitis the meeting adjourned.

The selection of the new officers is a very good one, and it is well that it is so, since they will be called upon to perform duties which promises to be of the most serious and responsible nature. The Association now numbers nearly one hundred and fifty members, and if, out of a representation of the veterinary profession of the United States so large as this, the officers cannot devise methods for stimulating their activity and developing a capacity and disposition for useful and interesting work, which must exist, we can but fear that the good name and merited repute which it now enjoys will be seriously jeopardized.

INTERNATIONAL MEDICAL CONGRESS.—When will the veterinarians of the United States enjoy the privilege of meeting their

brethren from abroad in a general International Veterinary Congress? Such a question is naturally suggested by reading the report of the proceedings of the Ninth International Medical Congress, where the physicians of both worlds, comprising, with others, delegates from America, Great Britain, France, Germany, Italy and Russia, came together in the city of Washington, and for an entire week discussed in scientific papers and debates the great and interesting matters pertaining to their calling. Aside from this, and quite as important an effect of the meeting, may be considered the goodly feeling and friendly sympathy established between the practitioners in human medicine of all the leading nationalities of the world, engendered by the hearty and magnificent hospitality they have received from their American brethren, following the cordial welcome extended to them by the President of the United States in their behalf.

This is an inquiry not a little difficult to answer. Yet Veterinary Congresses have been held, and though heretofore they have met only in the cities of Europe, there is no absolute reason why the cities of the new world should be entirely precluded in the selection for some future occasion, if not for the Congress which assembles in Paris in 1889. There is, however, one indispensable preliminary condition to be fulfilled before we can expect to induce the veterinarians of Europe to come to America, and this condition precedent devolves on us to perform—it is that we first go to Europe. At the meeting in Brussels America was represented by barely three veterinarians; the next meeting ought to be attended by a much larger representation. Let every State Veterinary Association, and every veterinary school on the continent, and the general Associations of the United States, appoint delegates, and let these, after first organizing themselves, go to Europe in a body in 1889, to represent the American veterinarian of to-day. We may then reasonably expect the friendly consideration, at least, of a proposition to make the city of Washington the place for convening the next Veterinary Congress.

An important fact which interests us as veterinarians in connection with the late International Medical Congress, is the recognition which it extended to the veterinary profession—an occur-

rence, by the way, of which mention seems to be entirely ignored in the reports we have noticed in our medical journals.

A graduate of veterinary medicine, who presented himself to the committee on admission and asked to be enrolled in his capacity of veterinarian, was at first repulsed, but subsequently accepted, without any apparently serious amount of reluctance, as he reports to us in the following letter :

WASHINGTON, D. C., August 6, 1887.

Prof. A. Liautard:

I yesterday applied for admission to the International Medical Congress, upon the representation of being a veterinarian and intimately connected with the sanitary work in this country, and demanded recognition not only for myself, but as well as a representative of the veterinary profession at large.

One of the clerks of registration referred me to Dr. Jos. M. Toner, the registrar, with the statement that he did not think any provision had been made for "horse-doctors." I then saw Dr. Toner, and upon informing him of my official standing, he said that he thought I could be admitted if I could produce evidence of being a graduate of a regular recognized veterinary college. As I don't carry my "diploma" with me, I therefore could not produce the desired requisition. But to-day, meeting Dr. John H. Rauch, Secretary of the State Board of Health of Illinois, and Dr. C. N. Hewitt, the Secretary of the State Board of Health of Minnesota, I was upon their recommendation admitted by Dr. Toner. Furthermore, as both Dr. Rauch and Dr. Hewitt are two of the leading sanitarians of this country, I was not only admitted on account of being a veterinary graduate, but admitted in recognition of the veterinary profession, and they emphatically claimed our right to it.

So far as I know, I am the only veterinarian who holds a membership, but that does not detract from the value of the recognition conceded by the International Medical Congress, which is supposed to represent all nations.

I think veterinarians may congratulate themselves in obtaining this concession to their special art, which is so indissolubly connected with the medical art at large.

Respectfully, M. R. TRUMBOWER.

This is, so far, well, and it is to be regretted that more veterinarians did not follow Dr. Trumbower's example. If this had been the case, a section of veterinary medicine might have been formed, and no doubt would have reported some good work.

We earnestly hope to see this example of the International Medical Congress followed by other organized medical bodies, and that veterinarians may receive the recognition they deserve, but which they have hitherto missed.

Professor Paquin's Letter.—A long letter from Professor Paquin, of Missouri, is printed in the present number of the Review. In the first part the Doctor treats the subject of hydrophobia, and refers to a case in respect to which he had kindly asked our opinion, and which we will at a future time utilize in order to answer a question put to the public at large relating to the establishment of a Pasteur Institute in this country.

The second part of Professor Paquin's letter is more important, and has in view the correction of an error which appeared in a former number of the Review. We gladly correct our erroneous statement, and take pleasure in knowing and showing that veterinary medicine is not, after all, held in such low public or governmental estimation in Missouri as to be so entirely ignored that the services of veterinarians are declined on the pretext of want of funds.

According to the letter of Dr. Paquin, Missouri has shown herself far in advance of many of the other and older States of the Union which lay claim to a more advanced civilization. A State which makes appropriations as liberally as the Professor reports, certainly betrays no mean appreciation of the value of the services of veterinarians and of the importance of the place they fill among the useful members of the body politic as sanitarians and guardians of the welfare of the commonwealth.

Director Nocard of the Alfort School.—Our French exchanges bring us intelligence of the retirement of Mr. Armand Goubeaux from the General Direction of the Alfort Veterinary School, and the nomination of Professor Nocard as his successor.

To be called, at the age of (about) 38, to fill a position which has been occupied by the Renaults, the Magnes and the Bouleys of the past, men who were already well advanced in years when called to the onerous duties of the place, is an acknowledgment of the most emphatic kind of the consideration which Professor Nocard has won from his contemporaries.

Our intercourse with Dr. Nocard has not been very familiar or frequent, but a long personal acquaintance was not necessary to beget a high appreciation of the man with whose writings we were, with a multitude of others, familiar. And in witnessing

his elevation to the office of Director over one of the most important veterinary schools in Europe, we see a guarantee and a promise of a new impulse to the cause of veterinary science in France, and therefore in the world.

Good Example from America Followed in Europe.—Our German exchanges have brought us the intelligence of the elevation, by Imperial decree, of the Veterinary School of Berlin to the rank of a University, with our excellent friend Professor Muller as Rector.

This is an interesting item, and involves a fact quite confirmatory, and so far highly flattering, of the American view of the estimation to which veterinary science is entitled, inasmuch as in taking the step referred to, the Imperial Government of Germany has merely followed an established American precedent. For years the Universities of the United States have maintained regular veterinary departments, and those of Cornell at Ithaca, in New York, and of Harvard in Boston, with that of the Pennsylvania University in Philadelphia, have illustrated the appreciation which veterinary studies and practice have long since reached in this country.

Age-telling in Old Animals.—Dr. Miller's letter shows, in his own language, "how difficult the test of age-telling in horses is, at times;" and yet a careful consideration of his letter shows that the only important difference of opinion existing among the twelve gentlemen by whom the mouth of the old mare was examined, occurred in respect to the period between "about sixteen" and above twenty-one. The characters of old age after twenty-one are very uncertain, and, to quote the expression of a puzzled student required to give the age of an old subject, about to be destroyed for dissection, the greater part of them may be said to be "*beyond the dentition table.*" And for this reason, perhaps, the nine gentlemen who made the old mare above twenty-one were all as nearly right as could be expected of persons obliged to obtain their knowledge exclusively "out of the mare's own mouth." To determine whether an animal is "sixteen years old or about," is comparatively a much easier task. But again, when the many causes that assist in altering the regular wearing of the teeth are taken into consideration, one need not be sur-

prised at the occurrence of an error, even during adult life, and still less at a more advanced age.

Veterinary Honors.—Our veterinary exchanges from England bring us the following interesting item: At the meeting of the Royal College of Veterinary Surgeons Dr. Fleming proposed the name of Dr. Huidekoper, of the Veterinary Department of the University of Pennsylvania, as an Honorary Associate of the College, which was seconded by Prof. Walley and unanimously carried. We offer our sincere congratulations to our confrere for this well deserving recognition of his efforts on behalf of our profession during the last few years.

ORIGINAL ARTICLES.

THE NATURE OF THE AMERICAN SWINE PLAGUE

IN REGARD TO ITS PREVENTIVE TREATMENT BY VETERINARY POLICE AND HYGIENIC METHODS.

By Frank S. Billings, D.V.M.

Director of the Experiment Station and Laboratory of the University of Nebraska for the Study of Contagious and Infectious Animal Diseases.

[Read before the Massachusetts Veterinary Association by its Secretary, Dr. L. H. Howard.]

No disease that occurs in animal life has but one cause. This axiomatic fact applies equally as well to contagious and infectious diseases as to others.

In order that we may be able to prevent a given disease, it is absolutely necessary that we first arrive at a correct conclusion as to its exact and real nature. Hypothesis will not do. Without exact knowledge as to the nature of a contagious or infectious disease, all attempts at its prevention will prove futile. A knowledge of the real nature of a contagious or infectious disease is of far more importance, in considering means to prevent it, than a knowledge of the character of its specific cause—the *causa sufficiens*. We may know *how* a given factum acts long before we may be able to discover the *thing acting*. By removing its means of action we may prevent the action, though the thing itself may continue to exist.

While we may not know the specific exciting cause with regard to a given disease, if we know the means by which it acts, the places in which it exists, which constitute the (so called) secondary, or supporting, or extending causes, we may prevent the ravage of such a disease, without in reality having attained any exact idea of the real nature of the specific cause, other than that it is of a contagious or infectious nature, as the case may be.

Let us endeavor to apply these principles to swine-plague.

In my communication upon the "Etiological Moment" in this disease—the micro-organism—I took occasion to call attention to the fact "that the American swine-plague is an infectious and not a contagious disease;" that in reality "it is a specific septicæmia, of extra-organismal origin,"—that is, that it is due to a specific micro-organismal element, which finds its primary and original locus and means of development in conditions entirely outside of the porcine organism.

I consider the establishment of the true nature of swine-plague of infinitely more importance than the discovery of its specific, inciting cause—more important even than the discovery of a practically possible means of prevention by an artificial vaccine.

Up to this time, all investigators in this country have pronounced the swine-plague to be a "contagious" disease. That opinion is unequivocally wrong. Being wrong, it is not to be wondered at that all attempts at its prevention have so utterly failed.

Law says:

"This disease may be defined as a specific contagious fever of swine."—*Report of the Department of Agriculture*, 1878, p. 379.

Detmers says:

"Swine-plague is a disease *sui generis;* it is communicated by direct (contagion) and indirect infection."—*Ibid*, p. 332.

Salmon says:

"This disease is contagious, and in the majority of cases may be traced to contagion."—*Report*, 1880–'81, p. 13.

Again Salmon says:

"The demonstration of the contagiousness of the disease has

enabled our agriculturists to do something to prevent its spread. Our investigations (!) have shown that swine-plague is a non-recurrent fever."—*Report*, 1883, p. 57.

The assertions of Law and Salmon that swine-plague is "a fever," show a bad want of a proper education in the principles of pathology. "A fever" as a specific disease is a pathological impossibility. The fever is a general phenomenon common to all irritative diseases, whether specific or not. Hence, when accompanied by fever, in common with every other acute infectious disease, swine-plague is not "a specific contagious fever," any more than it is a "non-recurrent fever," while in the majority of cases it is a "non-recurrent" disease.

Detmers, on the contrary, is practically correct in his conclusions, in that by "indirect infection" he means infection pure and simple.

To the unreflecting veterinarian, or non-professional reader, the above may at first appear as an attempt at splitting a hair, but it is far from that; to the correct treatment of any disease—medicinal or preventive—it is absolutely essential that both professional and laymen who may have anything to do with it should know what it is. Without this knowledge, any rational prevention of swine-plague will be found impossible.

A contagious disease is an endogenous disease: that is, one which invariably finds its primary origin in a specific element—also a micro-organism—which, with equal invariability, finds its proto-development within the individual organisms of a given species of animal life.

A contagious disease is communicated directly from one animal to another of the same or a susceptible species. Syphilis, pleuro-pneumonia contagiosa, are examples of contagious diseases limited to a single species. On the other hand, while the second variety are transmissible to a varied number of susceptible species of animal life, still they find their primary development in a given species with an equal constancy to the first named. To this class belong glanders, rabies, small-pox, foot-and-mouth and many other strictly contagious diseases.

The differentiating characteristic between contagious and in-

fectious diseases (aside from the transmission directly from organism to organism) is, that although the specific cause, in contagious diseases, may retain its vitality and virulence, under favorable conditions, for some time outside of the animal organism, still it does not continue its development there, nor does it really infect such extra-organismal material. It simply remains attached to it. It does not find the materials and conditions suitable to support its life and proliferating activities. It soon ceases to be dangerous. It loses its virulent activity and vitality.

The inficiens of glanders does not retain its virulence over forty days when bound upon the nasal discharge, or some other material, from a diseased animal. The rinderpest inficiens does not retain this activity for over six weeks, if it does as long as that. We know little or nothing about contagious pleuro-pneumonia in this regard.

Medical technology and language are used with utter disregard of the common decency of exactness.

Nowhere else is this more apparent than in the use of the words contagious and infectious. In general, no attempt at any logical or scientific differentiation is made. They are used one for the other, in absolute ignorance of their true meanings.

Infectious diseases, or exogencus diseases, are such in which the specific cause—the inficiens—finds its source of primary origin, and support, and the natural conditions suitable to its existence in extra-organismal conditions; that is, outside of any animal organism.

The earth, compost and such refuse materials offer, in general, the conformable physical and chemical conditions to the support and development of the inficiens in infectious diseases.

Vegetable materials grown upon such lands, the earth, or refuse itself, the air and water, contaminated from or by them, form the chief media by which susceptible animals become infected.

According to their character, then, infectious diseases must be distinguished as:

Endogenous or contagious, *per se.*

Exogeneous or infectious proper.

Exogeneous—malarial—infectious, or absolutely local infectious diseases, in which the animal organism plays no part in their extension.

The peculiar or idio-pathogenetic characteristics of the inficiens, in each case, decides the special nature of the disease.

Swine-plague is a disease having a purely infectious character (anthrax, Texas fever, Asiatic cholera, are well known examples of the same class of diseases). It is a disease in which the inficiens finds its primary, original development outside the porcine organism. Genetically speaking, the inficiens is extra, and never of primary intra-organismal origin.

The inficiens finds its suitable media for natural development in the earth and refuse earthy materials, and requires certain conditions of moisture, heat and chemical constituents to its support and progressive development.

These facts established, we have discovered the nature of a given disease, and the key to practical methods of prevention. While we may never have seen the inficiens, we have discovered where it lives and thrives, under what conditions it does this, and by keeping susceptible animals away from such places for a given period, and by altering the conditions so as to render them unfavorable to the existence of the inficiens, by confining the diseased animals, and other precautions to be mentioned hereafter, we have the principal effective means of preventing infectious diseases at our command.

This has been possible with anthrax. Where intelligently applied, localities that were absolutely unsafe for cattle, horses or sheep to graze upon, have been rendered valuable grazing grounds by digging up and burning every cadaver, by the thorough drainage of the land so as to keep the height of the ground water at a low level and by keeping all animals off such land for two years, except those necessarily used to plough it up and expose it to the sun and air several times a year. In general, the dangerous localities are small, and can be fenced in, and by simple lowering of the ground water can be rendered safe in two years.

In order that a susceptible animal shall become infected with an infectious disease of this nature, it is necessary for it to be in

or upon an infected locality, or to come in contact with something derived from such a locality, such as the earth itself, or grains, hay, grasses or roots grown upon such earth. Such diseases are strictly local in their primary origin.

There is a phenomenon, however, in connection with many of these primary local infectious diseases which has led, and, unfortunately, still leads to an immense amount of unnecessary confusion and misunderstanding, which it is very essential should be cleared up.

Attention has been previously called to the fact that susceptible animal organism, in case of primary infection, must be in or upon such infected localities. Such localities form the (so called) fixed or natural centers of infection. These fixed or natural centers of infection are to be looked upon in a far different light than animals infected with a contagious disease, though they also form the only natural centers of primary infection. The primary center of infection in contagious diseases is movable. The dangerous principle bound upon it is not fixed in any given locality. The infected animal in contagious diseases is the primary, while in infectious diseases it is a secondary center of infection. Here, again, we have an animal organism acting as a movable center of infection, *but not contagion*—that fact must not be lost sight of. Such animals can infect other localities, but not other animals directly, in the sense that contagious diseases pass from animal to animal.

The living animal then becomes a traveling medium of infection, and although of itself not directly dangerous to other animals, yet in many diseases such an infected individual is far more dangerous than one affected with many contagious diseases, though it takes longer for the danger to become apparent.

Such an animal can infect the localities in which it comes. While the animal afflicted with a contagious disease can also leave effluvia that may be dangerous for a time, it soon dies out, but this other animal leaves seed that, the conditions being favorable, develops and multiplies, giving occasion to the infection of other animals, and they to other localities, and so the destroyer gradually extends over a country, seldom marking its course by a gen-

eral conflagration, but rather by bivouacks of destruction here and there, which become more and more frequent and near together the longer mankind neglects making proper endeavors to check its course.

It can thus be seen that the regulative and hygienic preventive of specific infectious diseases is, in many cases, much more difficult than the contagious variety. Every spot is a seat of danger, and one that may continue so for months or years where an animal has been that is affected with such an infectious disease as anthrax or swine-plague. Not only that, but, under favorable telluric and atmospheric conditions, the specific cause, the germs, gain access to the air by transportation from the ground, or become attached to the vegetation, and thus the disease may spread in ways mysterious and strange to the farmer and stock owner.

It is sometimes very difficult indeed to decide whether a given disease is contagious or infectious. The opinion of the general practitioner is not worth a fig upon such a subject.

It often happens that a disease extends rapidly over a country among a given species of animals. In this regard I have only to call attention to the horse epizootic of 1872. The world said it was "contagious." It was not! It was infectious. Horses undoubtedly aided in spreading the infecting element, but at that time there must have existed peculiar climatic and telluric conditions, which have not since occurred. There was a common infecting cause to which the equine organism was alone susceptible, that extended from North to South, East to West.

Had it been a contagious disease, it would never have worn its energies out as it did.

Again, in infectious diseases it so happens that under peculiar circumstances there is no doubt that the disease becomes transmitted from one animal to another in the same stable. This fact has led many reputable men to speak of such cases as "contagious," but they are not. The transmission in such cases is not due to the cohabitation in the same building or house, but to some accidental circumstance; some intermediate factor comes into action; accidental inoculation occurs, not transmission per contagion. The sick individual does not convey the disease; some-

thing takes material from it and inoculates another, or the latter is wounded somewhere and inoculates itself with effluvia from such an animal, but direct infection from animal to animal does not occur.

In this way anthrax is conveyed by flies biting a sick animal and then going to a healthy one and sticking their soiled proboscis, with anthrax germs upon it, into the skin of such, and the disease occurs in No. 2, and so it may be carried to others.

Is that contagion?

Or a man has a cut on his finger and has the care of such cattle, and gets some fresh manure on his fingers and dies of malignant pustule.

Is that contagion?

Had the stable been kept properly darkened in the first place, and fly-screens on the doors and windows, the disease would not have been transmitted to the other cattle, and the sick ones could have died among them and no others have acquired the disease, if other necessary precautions as to food, water and utensils had been taken.

In the second case, had the man not had the wound on his finger, or had he had it properly covered and been more cleanly about his work, he could have worked among anthrax diseased cattle indefinitely and remained well.

(*To be continued.*)

COMPARATIVE LESSONS OF BRAIN WOUNDS.

By Dr. G. Archie Stockwell, F.Z.S.

(Written especially for the American Veterinary Review.)

Comparison of the crania of vertebrata reveals in each instance a citadel carefully walled and fortified about, to meet the necessities of the class or types in protecting the organ of intelligence and will. The very points that, to superficial observation, would be deemed the most vulnerable, on closer and more careful inception prove to be built up and buttressed in an extraordinary manner, with here an arch, there a ridge, again an angle or pro-

cess, in each and every instance securing to the part a *maximum* of strength, with a *minimum* expenditure of material; then, as if this were not enough, the whole is usually supplied with a movable *glacis*, so to speak—the scalp—that is well calculated to divert approach and convert the direct to an indirect assault. Herein lies the comparative infrequency of traumatic injuries of the head as with other and less exposed portions of the creature economy.

Because it is the seat of voluntary impulse and the prompter of the various functions that collectively maintain the mysterious phenomena of Life, until within a half decade the brain has received but trifling, or at least superficial, attention at the hands of the surgical pathologist. It is only yesterday, as it were, that the theory of non-interference in traumatic lesions of the head was carefully inculcated and persistently insisted upon, and even to-day nine-tenths of the medical profession are blinded by this ancient *fetich*. It was, and yet is, believed that the nervous system is a structure so frail, complex and uncertain as to be beyond the delicacy of the human hand and mind, and consequently not to be meddled with even in attempt to restore and further its functions.

Even the pagans of Greece and Rome were superior to us in this respect, for Celsus describes the symptoms of abscess and blood clot within the dura, and an operation for relief; and in Egypt have been found mummies exhibiting marks of a trephine that manifestly had been applied for other purposes than fracture.

With the decline of the ancient colleges, art and science fell into decay, and it was the early Fathers of the Church who, distorting the Esoteric doctrine of the Mysteries that yet lingered as mere superstitions, located a spiritual and Divine essence within the brain, and promulgated the dogma that to meddle with this "seat of soul" was an "insult to Deity."

The difficulty of ridding the human race of the superstitions of centuries is well exemplified by the indifference with which recovery after severe injury with loss of brain substance has been regarded; instead of being deemed natural results of reparative

processes worthy of imitation and fostering, such were only "wonderful" or "phenomenal." No conclusions were offered or drawn; the lessons inculcated by Nature were ignored, and all bowed down to the miraculous, forgetting the teachings of the Greek school—*Thaumata moris*—"Miracles for fools"; and at last, when a few bolder spirits ventured to suggest that the nervous system might be equally tolerant with other tissues and organs, and that within itself was contained the same means of reparation and reconstruction, they were derided and laughed to scorn. Happily common sense is at last in the ascendant, and it is safe to predict that the day is not distant when the brain will be as freely amenable to surgical procedures as the organs of the abdomen.

Before the brain can become the seat of traumatic injury, its protecting walls must be penetrated, and accordingly we find three phases of fracture: of the base, of the vault, or of both. By authors and teachers the first and last are held "invariably and necessarily fatal"; this is the testimony of Erichsen, Wood, Cooper, Neudorfen and hosts of others, and is the more remarkable in that such premises have been *practically* disproven. There is scarce a well-appointed anatomical museum in the United Kingdom or in the United States that does not present crania exhibiting repaired basal fracture that occurred months and even years prior to demise, and that too (in the few instances where the history could be traced) with so little influence upon life and function as to pass wholly unrecognized. Farther than this, the subject of basal fracture does not invite attention in this connection.

Again, fracture may involve the outer, the inner, or both tables.

The first, as a special lesion, does not invite comment, since its relations to brain injury are merely secondary. The two latter, while demanding the closest attention, may, for all practical purposes, be held identical, the results, and even the treatment, being the same.

Fractures involving the inner (or inner and outer) table, almost invariably are attended with extravasation of sanguinous

fluid within the cranial cavity, which may present itself in one or more of five situations: 1. Between the dura mater and the osseous vault; 2. In the cavity of the arachnoid; 3. In the pia-mater; 4. Within the substance of the cerebrum; 5. Within the ventricles. And the relative frequency thereof is in the following order:

Cavity of arachnoid; between dura and skull; in the pia-mater; in brain and ventricles.

Extravasations into the cavity of the arachnoid necessarily have their source in the vessels of the pia mater, in the superficial veins, or in the great sinuses, and arise with apparent equal facility from slight or severe wounds. Those between the dura and skull originate from small arteries passing from the membrane to the osseous vault, from the middle meningeal, or from the venous sinuses, and may develop suddenly or slowly, and in greater or less amount, according to circumstances. Hæmorrhages into the pia, and into the ventricles and substance of the brain, are invariably the sequel to laceration of cerebral substance.

Coagula within the arachnoid and pia are especially prone to cover considerable superficial areas, and between the dura and vault to speedily take on decomposition whereby are developed cerebral and meningeal complications with fatal results. In the former, prognosis is always grave; for even should not death immediately supervene, the attending symptoms of nerve irritability, such as migraine, epilepsy, insanity, etc., etc., render the sufferer a burden to himself and to others; and while it has been claimed that absorption may take place within the arachnoid, the physiological relations wholly preclude such supposition! However, extravasations beneath skull and within the arachnoid have been removed by operative procedures, and with little difficulty or danger; and for this reason this portion of the subject may also be dismissed to discussion on hæmorrhage and coagula within the brain and ventricles, to meddle with which is almost universally deemed unjustifiable, even to criminality.

As a sequel to fracture and extravasation, we may have conditions occurring within cerebral substance as follows: 1. *Concussion;* 2. *Contusion;* 3. *Compression;* 4. *Pachy-meningitis;*

5. *Leptomeningitis;* 6. *Intru-dural suppuration;* 7. *Encephalitis;* 8. *Abscess;* 9. *Pyæmia;* 10. *Hernia-cerebri.*

Concussion, if unaccompanied by hæmorrhage, is the natural sequence of injury or infraction of cerebral substance or its membranes. *Contusion*, on the contrary, designates a condition resultant upon rupture of blood-vessels, or laceration of the more minute and microscopic brain elements. *Compression* may result from effusion of blood, depressed portion of punctured vault, entrance of foreign substances, hyperanemia, or exudations. *Pachymeningitis* is critically described by chronic and local inflammation of the dura resulting (secondarily) in thickening, new formation, and (subsequently) necrosis of the osseous vault. *Leptomeningitis* indicates acute or sub-acute inflammation of arachnoid and pia-mater arising from irritative agencies. Intra-dural *suppuration* is a common sequel of putrescent coagula, necrosed bone, or other irritating and foreign substances. Traumatic *encephalitis* may develop from concussion or laceration either with or without deposit of bone spiculæ and extraneous matters. *Abscess*, *pyæmia* and *hernia-cerebri* are secondary factors, hence of connective and subjective importance merely. The direct complications of cranial fracture, however, are *encephalitis* from injury of cerebral substance, and *inter-cranial hæmorrhages.*

From exhaustive and carefully compiled statistics prepared by Wharton, of Philadelphia, I have been able to formulate the percentage of fatality attending the different classes (regional) of perforating injuries of the human cranium, as follows:

Orbital, 17–18, or 94 per cent.

Sphenoidal, 4-5, or 80 per cent.

Occipital, 2-3, or 66 2-3 per cent.

Parietal, 1-2, or 50 per cent.

Frontal, 3-7, or 43 per cent.

Temporal, 2-5, or 40 per cent.

The showing is by no means satisfying.

Examining the statistics more critically, I find the sub-diploetic or dural surface of the skull is invariably the greatest sufferer, in obedience to the well-known philosophical law, that injury follows in the *line of extension* rather than that of compression.

When fracture is not promptly followed by collapse and dissolution, the first question that presents itself is, the feasibility of surgical interference, including operative measures for the relief of compression.

From various experiments conducted on lower animals, especially in connection with intra-dural inoculations and the artificial production of suppuration, abscesses and compression, I am satisfied that operative interference, in a majority of instances, is not only feasible and justifiable, but desirable and imperative, even to the free use of the knife *upon* the brain, and *within* its cortical substance!

If the evidences of compression are continuous and urgent, as manifested by unconsciousness, coma, stertorous respiration, dilated pupils and motor paralysis, they may justly be attributed to depressed bone or the introduction of some substance from without. If the evidences appear only after a lapse of some hours, we are well grounded in surmising them the result of *hæmorrhage;* if delayed for some days, to *pus.* In either case compression will be uniform, owing to the adaptability of the cerebro-final fluid, and its obedience to the well-known law that fluids under all circumstances maintain their equilibrium. Again, where the blood-vessels are largely deprived of their contents, we have *anæmia*, whence unconsciousness, coma and labored respiration; and when the corpora quadrigemina and third pair also suffer, dilatation and paralysis are to be expected. Undoubtedly, in the great majority of instances compression is due to extravasated blood, or the formation of purulent fluid; and so far as can be gathered from statistics, it would seem that at least *six-tenths* are due to the latter cause.

Following statistical evidence further, we find pus forms between the dura and skull in *five* per cent. of the cases only, and that in *twenty-five* per cent. it arises from suppurative meningitis, and in *seventy* per cent. develops an abscess with the cerebral substance!

"Symptoms of purulent fluid within and about the meninges commonly occur between the *sixth* and *twenty-first* days; but those of cerebral abscess, only between the *fourteenth* and *twenty-fifth* day."—*Naucrede.* (!)

If pus manifests itself within the cranium, what is the result? In spite of contrary suppositions, there is no authentic case on record wherein a collection of purulent fluid within the arachnoid has been absorbed, and the greatest of surgical rarities is spontaneous evacuation of cerebral abscess!

It may be admitted that, under conservative treatment, in some few isolated instances, where pus had collected near the surface, it also succeeded in penetrating the obstructing barriers and securing for itself an outlet external to the skull; but such inculcates no lesson or example (other than resort to the trephine and knife) worthy of dependence; and should it fail to secure such outlet, as is necessarily the result in the majority of instances, the retained fluid must needs be a source of incalculable and grave mischief. The statistics of such conservatism exhibit a death ratio of *seventy-four* per cent. Neudorfen, who is one of the foremost advocates of operative interference, exhibits tables wherein the death rate is but *fifty-seven* per cent., and with the disadvantage that such interference in the majority of instances was delayed until the last hour. And yet, with this discrepancy (*seventeen* per cent.) in the favor of surgical measures, we find the multitude of surgeons, Ashurst among others, persistently and dogmatically inculcating strict conservatism and dependence upon the operations of nature. Per contra, I am glad to note that such eminent authorities as Gross, Liddel and Roberts have recently entered the lists in endorsement of Neudorfen.

(*To be continued.*)

INOCULATION AGAINST ANTHRAX AND ITS VARIOUS FORMS.

(Abstract from the Report of Prof. Robertson to the Royal Agricultural Society.)

The experimental work undertaken in connection with the above named diseases of farm stock was specially directed—1. To test the statements regarding the efficacy of Pasteur's preventive for anthrax. 2. To discover the best means of carrying out protective inoculation for the disease recognized in Britain by the

name of "quarter-ill"—"symptomatic anthrax." The latter being, in the meantime, regarded of greater importance, had directed to its elucidation the larger share of attention.

1. As to the claims of the Pasteurian prepared "vaccine" to serve as a preventive against the attacks of anthrax: Having obtained from the accredited agents in Paris a supply of this material, it was first examined microscopically, and tested on small rodents, to prove the existence of organisms and its possession of active properties; in both respects it proved true to description.

On the 13th of October two young bullocks had injected into their subcutaneous tissues a dose of "premier vaccine," and on the 24th each animal was inoculated with the prescribed amount of "deuxieme vaccine." It is to be remembered that two inoculations, with an interval of ten days between each, are deemed necessary to obtain protection. Neither of these inoculations produced appreciable general disturbance. On the 10th of December some virulent material obtained from the spleen of an ox which had died from an attack of anthrax, after being diluted with distilled water, was injected into the subcutaneous tissues of one of the oxen "protected" with Pasteur's vaccine, and of another ox which had not been so protected. There was no appreciable general disturbance in either of these animals.

Thermometric observations, however, showed a very high temperature in the unprotected animal, remaining, with slight variations, up to near 107° Fahr., till the 16th. That of the protected ox became elevated on the day following to 106° Fahr., after which it receded almost immediately to normal. A rabbit inoculated with the same material and at the same time, died of anthrax in eighty-five hours after the operation. On January 28th, on obtaining virulent material from one of a number of cattle which had perished in an outbreak of anthrax at Chelmsford, thirty minims of a mixture of this and distilled water was injected into the connective tissues of the remaining ox protected with Pasteur's vaccine. Beyond the fact that the temperature rose on the following day to 106° Fahr., and a little swelling appeared at the point of inoculation, there was nothing worthy of remark till February 13th, when an abscess formed at the seat of

previous swelling. This was opened in a few days and the pus evacuated. A rabbit subjected to the same test died of typical anthrax in seventy-eight hours.

The foregoing cannot be regarded as absolute and in itself sufficient proof of the protective power of the Pasteurian vaccine, though it is certainly favorable to it.

2. Our attention was now turned to discover if any reliable means obtained by which protection could be secured against fatal attacks of that disease recognized as "quarter-ill." This is particularly an affection of young stock; it is extensively distributed over Great Britain; it is generally well recognized, and is very fatal. From the changes which occur in the soft structures, and the rapidity and fatality of its issues, it has for long been confounded with pure anthrax. It is, however, now believed to be essentially distinct. Both are what are known as microbic diseases, *i. e.*, they owe their existence to the entrance into, and growth in the animal tissues of a specific micro-organism. Each disease is now recognized to be dependent for its existence upon its own individual microbe.

Before proceeding to test the efficacy of certain modes of preventive inoculation which had been stated to be effectual by the French experimenters, MM. Arloing, Cornevin and Thomas, we determined to satisfy ourselves of the asserted contagiousness of this malady. This was demonstrated to our satisfaction, by injecting one drop of muscle-juice from an animal which had succumbed to the disease, into the subcutaneous tissue of each of two guinea-pigs, and five times this amount of the same material into the haunch of a young bullock. The guinea pigs died from quarter-ill in ten and a half and thirty-six hours, respectively, the ox in thirty-seven and a half hours. Muscle juice from the local lesions of all these cases proved, by further testing, that it contained the specific microbe.

Having considered and examined the several accredited experimental modes said to afford protection against this disease, two were selected for trial as more likely than the others to yield the wished-for results. The first which we took up was that of employing the dried muscle-juice of the local lesions of the dis-

ease as a material for inoculation. This, it may be mentioned, is the means recommended by the French experimenters already named, and extensively employed in France. This material, or "vaccine," is now an article of commerce in France, so, having ascertained by letter from M. Arloing that M. Fromage, of Paris, was his agent for its sale, we obtained from this source the requisite supply.

Through the kindness of C. de Murietta, Esq., of Wadhurst Park, Sussex, six young cattle were placed at our disposal for experimentation.

On the 21st of August, Professor Penberthy inoculated these animals in the manner prescribed, with M. Arloing's vaccine, the second inoculation being executed ten days afterwards. These animals were then, with six others, placed in a pasture traditionally notorious for the fatalities of quarter-ill occurring in it. The internal temperatures of the animals were regularly taken and registered, but these showed little variations from normal. Two months elapsed without appreciable change in the animals. On the 30th of November three of the vaccinated and three unvaccinated animals were tested by an injection of 4 C. C. of virulent muscle-juice taken from a fatal case of quarter-ill. Save slight lameness of one of the vaccinated and one of the unvaccinated beasts, no unnatural effects followed.

A further testing of the remaining vaccinated and a similar number of unvaccinated cattle was attended with like negative results. That the material employed in this testing was of a virulent nature, was proved by its producing quarter-ill in a guinea-pig on which it was used, this creature succumbing in twenty-eight and a half hours.

In the light of other experiments which followed, the results of these at Woodhurst Park are not easy to explain. The susceptibility of animals to contract this disease we know is influenced by conditions residing in the animals themselves, as well as by such as operate from without, but whether these cattle were rendered more refractory from being located in this particular situation, where the disease is said to have an abiding existence, is yet uncertain.

Not being satisfied with this trial of M. Arloing's dried powder, a fresh quantity was obtained from Paris, and on the 10th of January a heifer and steer, about ten months old, were inoculated at the veterinary college, the operation being perfected by a second operation after the prescribed interval.

The testing of these fresh vaccinated cattle was rendered possible by our having to investigate an outbreak of quarter-ill among the young stock of Mr. Godman, Horsham, who, having lost one animal, was desirous of having his remaining ones preventively inoculated. The case which had proved fatal being considered a typical one material was taken from it with which to test our vaccinated animals at the college. Both the cattle and one guinea-pig, unprotected, had injected into their connective tissues a little of the muscle-juice obtained from the dead ox. In all these animals this inoculation proved fatal. The guinea-pig died in twenty-four and a half hours, the steer in forty-four and a half hours, and the heifer in forty-seven hours. After death, examination disclosed well-marked lesions of quarter-ill.

Being now rather dissatisfied with our trials of the dried muscle-juice as a protective "vaccine," attention was turned to the second method already referred to for producing immunity, viz., that of intra-venous injection of simple diluted virus. Experimentation on this system was rendered possible by the generous offer of Major Algernon Percy, of Hodnet Hall, Shropshire, to place certain animals at our disposal for this purpose. The opportunity to commence this trial was afforded on November 11th, when, in response to a telegram from Major Percy, Prof. Penberthy proceeded to Hodnet. On the morning of the 12th, in the presence of many interested in the experiment, four calves, duly marked for identification, had a regulated quantity of muscle-juice, previously mixed with water, injected into the jugular vein. This muscle-juice was prepared by straining through coarse linen, and was conveyed into the blood stream by means of a hypodermic syringe. Following the operation, the four calves, with a similar number of uninoculated, also marked for identification, were turned into a pasture and treated in every way alike, except that the temperatures of the inoculated were

taken twice daily for eleven days. From these latter observations it was found that the heat regulating function was scarcely disturbed.

On the 25th of November, from the death by a natural attack of quarter-ill of one of the uninoculated calves, and of another heifer at Hodnet, an opportunity was given to test the efficacy of intravenous inoculation. In the presence of several interested gentlemen, some of whom had witnessed the inoculations on the 12th, Mr. Penberthy injected, with all antiseptic precautions, into the subcutaneous tissue of the limbs of the remaining seven calves a considerable quantity of virulent matter taken from the muscle of a still warm heifer which had died from quarter-ill. The seven animals were then placed and kept together in a meadow under identical conditions. The results of this testing were: Of those inoculated intravenously on the 12th of November, none appeared to suffer in the slightest degree; of the three unprotected, two sickened on the 26th, one of them dying on the 27th, the other on the 28th. Both of these, on being examined after death, were stated to have exhibited well-marked lesions of quarter-ill. The third of the unprotected calves showed, on the 28th, a crepitating swelling at the seat of inoculation, and was dull and unwell on the 30th; a well-defined swelling existed at this spot, which gradually softened on the subsequent days, the calf returning to a state of health.

In order to prove the practicability of the intra-venous method of inoculation, on December 22d, Prof. Penberthy, with the aid of Mr. Tomes, the bailiff of Hodnet, inoculated as described twenty-four young cattle. The operation lasted about an hour and twenty minutes. On this occasion, in every case the injection was done by piercing direct through the skin into the lumens of the vein. These animals, Major Percy reports, have shown no signs of indisposition after the inoculation, nor have any cases of quarter-ill appeared amongst them.

The practical outcome of this work appears to be, that it ha-made clear the fact of the communicability by inoculation of the disease known in England as "quarter-ill," and its identity with that treated by MM. Arloing, Cornevin and Thomas, as "charbon symptomatique."

That without further proof of its efficacy we cannot recommend the use of M. Arloing's dried muscle-juice as a means of protecting cattle from the disease in Great Britain.

That inasmuch as some of our experimental guinea-pigs, after being "vaccinated" with muscle-juice subjected to the influence of a lower temperature than that recommended by M. Arloing, resisted the action of the injected virulent matter, some of which killed cattle and other guinea-pigs vaccinated with Arloing's powder, further experimentation in this direction should be made.

That the Hodnet Hall experiments go far to prove that the intravenous injection of considerable quantities of fresh virus is protective, and, to a large extent, practicable. The greatest drawback to its general adoption seems to be the necessity for fresh material with which to inoculate. This difficulty is not really so great as at first sight may appear. It has at least this in its favor, that it entails the existence of the disease on the estate, and does not encourage the chance of introducing fresh disease from without, as may be asserted of some systems of inoculation. In view of the results already obtained, we strongly advise the further and fuller adoption of this plan.

AMERICAN VETERINARY COLLEGE.

HOSPITAL DEPARTMENT.

A COMPLICATION OF CAUDAL AMPUTATION.

By Dr. J. Heulsen, Jr., House Surgeon.

A bay gelding, fifteen hands high and four years of age, entered the hospital on June 27th, with the following history:

Two weeks previously the tail had been amputated, about fourteen inches from the base, by a horse dealer, who, to stop hæmorrhage, applied a ligature of twine, which was allowed to remain twenty-four hours. The animal was then put to work, and ten days ago, the owner says, the tail commenced to swell until, becoming alarmed, he sought treatment.

On the day of entrance to the hospital the tail was found swollen to twice its natural size, and the hair matted with a thick,

greasy discharge. Examination showed throughout its whole extent an infiltration of pus in the form of numberless small pustules or abscesses, many of which had opened and were discharging.

Symptoms of approaching gangrene seemed plainly visible: six inches of the end of the stump was congested, of a dark-reddish coloration; cold to the touch; sensibility not entirely diminished, and with an apparently irregular line of demarcation of healthy and diseased tissue.

At the end of the stump, the black, necrosing portion of a coccygeal vertebra protruded one and a-half inches.

The disease seemed also to be making rapid strides anteriorly to other parts. The perineal region was swollen and softish to the feel, and lancing discovered a large pelvic abscess, opening above and to the left of the anus, the track being found with the probe to extend ten inches inwards and upwards into the pelvic cavity.

In fact, the general appearance of the parts was such as to preclude almost all possibility of successfully coping with the disease.

Treatment was undertaken, however, more as a matter of experiment and at the owner's urgent request, than with any great hopes of recovery.

The chief danger now to be apprehended was septicæmia. Temperature, 104°; pulse somewhat weak, but normal in number of beats, and respiration normal. Appetite good, and the discharge from the wound had so far been healthy.

Two small abscesses near the base of the tail were also lanced with the bistoury, with a discharge of about two ounces of healthy pus, and injection of carbolic solution into the cavities. The parts were then thoroughly cleansed with the solution, and a pad of oakum and bandage applied.

June 28.—Temp., 102°; resp., 20; pulse normal, full and strong.

Appetite still good. There is quite an abundant discharge found on removing the dressing. The hair is commencing to loosen and fall out, and to facilitate dressing it was at once

clipped, and the stump, with its raw surface and distorted pro portions, revealed fully to view.

Two more abscesses were opened near the base, one above and the other below, discharging about two ounces of pus.

It seems as if the whole tail were composed entirely of small multiple abscesses; for passing the hands, with pressure, from the base to the end, caused small discharges or oozing of pus from the numerous openings. None of them were large, and many connected with one another. From the pelvic abscess there is an abundant healthy discharge, and the portion mentioned above as showing signs of gangrene, is in same condition.

To-day dressed twice with injections of carbolic solution, and thorough cleansing. The piece of necrosed vertebra was withdrawn with the bone forceps, the cavity packed with oakum, and edge cauterized with nitrate of silver.

June 29.—Temp., 103–1°; pulse, 48, strong; respiration a little increased. Appetite continues same. The condition of the tail still warrants no better prognosis of the case. Abundant discharge, and dressing twice a day.

June 30.—No appreciable difference; perhaps less tumefiied. Discharge healthy. Temp., 102°; pulse, 40; resp., 20. Same treatment.

July 1.—Swelling decreasing, and healthier appearance; not so congested and blackish. Discharge continues same. Temp., 103.2°; pulse, 48; resp., normal.

July 2.—Temp., 102.3°; pulse and respiration normal. Continuing the same treatment of pressing out the discharge from the great numl er of abscesses; new ones continually developing, and incisions made to enlarge the openings of many of them. About the same appearance as yesterday. ʒ ii. quinine sulph. administered three times to-day.

July 3.—Temperature, 102°. Same treatment. Slight improvement.

July 4.—Swelling and discharge decreasing, and healthier appearance. The case is assuming a different aspect, with reasonable hopes now of recovery. Temp., 101.2°.

July 5.—Temp., pulse and resp. normal. Appetite good. Discontinued quinine.

July 5 *to July* 10.—Gradually improving; decreasing in size, and healthy discharge. New abscesses opened every day, and many healing. Same treatment in dressing. Temp., resp. and pulse normal; appetite same. The pelvic abscess has ceased discharging, and is apparently closed. Prognosis now favorable, and it is only a question of time.

July 11.—Only three or four abscesses now that are discharging, but of course others developing. The granulations at the end of the stump are bulging, and nitrate of silver or chloride of zinc is applied. The tail is of nearly natural size, though still of ugly appearance.

July 12 *to* 21.—Improving. Tail assuming more and more its natural condition, though still of ugly appearance from loss of hair. One or two small abscesses being opened every day, and dressing once a day; chlor. zinc solution mostly used to cauterize openings of abscesses and end of tail.

On July 18th another large pelvic abscess discovered on the right side of the anus, with a track leading upwards and inwards, about six inches long, but discharge is scanty.

July 22 *to Aug.* 9.—Very little discharge; tail almost normal in appearance. A new abscess developing almost every day, and the old ones nearly all healed.

August 18.—About same condition. Appetite good. The stump is nearly all healed, except the end, which still presents granulating surface, and will take some weeks yet to recover.

The chief blemish now considered is the loss of the hair, which is growing very slowly, and only in patches; but the owner, by the resources of art, will be able to overcome this difficulty, and in a short time we shall have the pleasure of seeing our patient taken from our care, ornamented with a beautiful and artistic caudal appendage.

CASE DEPARTMENT.

VOMITION IN THE HORSE.

By Dr. W. A. Speer, V.S.

I recently attended a case that might be of interest to the readers of the Review. The subject was a Texas pony. After being

driven twenty miles evinced symptoms of great pain by rolling and perspiring profusely. When made to get up he began retching and presently the act of vomition was profound, in which partly masticated hay and oats were discharged through the nose. Thinking I had a case of rupture I did not give anything internally, but administered morphia, grs. iii. hypodermically. In half an hour the retching ceased, when I gave soda hyposulphite and an unfavorable prognosis. The next day I visited the animal, expecting to find it dead; but it was alive, though very dull. Stimulants were given and the second day the animal was put to work.

CORRESPONDENCE.

MISSOURI RECOGNIZING THE VETERINARY PROFESSION.

Dear Sir:

Pardon me for not replying sooner to your favor of the 29th July. I have been extremely busy in my official capacity these two months, and hence my delay.

I thank you sincerely for your advice regarding Pasteurization against hydrophobia, as practiced in New York. I am well aware that, to have success with it, the series of operations must be performed with the greatest care and with perfectly good and safe virus-vaccine. During my stay in Paris last year I carefully studied the treatment for several months at Mr. Pasteur's laboratory itself, where I had the privilege of attending once or twice a week the conferences given to a few at this institution by Dr. Perdrix, one of Mr. Pasteur's chief assistants and late of Koch's laboratory. The cases I telegraphed you about were doubtful. I was absent when a child belonging to Prof. Buckmaster, of this place, was bitten on the hand by a dog running at large through the country, and which had been seen to bite horses, cows, etc., on its passage. It was a young shepherd dog and did not have very dangerous teeth. I found out since that another dog with which the would-be rabid one had a fight came out without a scratch. When I arrived it was too late to inoculate anything

with the spinal cord or bulb of the mad animal, as it was about totally destroyed (the subject having been killed days previous). Thus I was left without anything reliable to form a diagnosis. But the members of the family were greatly excited, and so I told them that for safety, and to ease their minds, they might resort to the only good preventive treatment known, "Pasteur's inoculation." It was then that the family desired me to find out whether it was practiced in New York. Therefore, knowing you would advise me safely and cheerfully, I wired immediately.

I hardly think that the dog in question was rabid.

While I write this let me say a few words to correct a statement in the last number of the VETERINARY REVIEW, to the effect that Missouri appropriated nothing at the meeting of its last Legislature for the State Veterinary Service.

This is far from being a fact. Although this State is comparatively quiet over her results in the line of veterinary science, it were ungrateful to allow the country to believe that she is backward in this respect. In fact I dare say that in the same length of time, and with as few veterinary workers, no State or Territory in the Union has done better for the protection of her live stock through science, and none have recognized more rapidly and more substantially the value of the educated scientific veterinary practitioner. Let me explain, and you and your readers may judge for themselves.

In the spring of 1885 I had the honor of being appointed State Veterinarian under a crude and almost impractical law just enacted. I worked two years under it and notwithstanding its very difficult sections, I had the pleasure to show, at three months intervals, that many cases of glanders, black-leg, etc., etc., had been successfully attended to as the nature of the maladies demanded. Nine or ten months of labor seemed to please the authorities, and they began to study the subject a little more closely. In the meantime your humble correspondent had about a dozen opportunities to address farmers' and "agriculturists' institute meetings." There various diseases were discussed, and sometimes prescribed for free of charge in a friendly manner when no regular veterinarian was in the neighborhood. All this was done under

the management of the State Board of Agriculture. By degrees we managed to get the people interested by these labors, reports and writings, and in February, 1886, the University Board of Curators, with consent and endorsement of his Excellency John S. Marmaduke, Governor of the State, sent the State Veterinary Surgeon to Europe to study contagious diseases more closely and to investigate and study Pasteur's methods of investigating them. This officer was abroad seven months, all the time under salary.

This year a report of the work accomplished in the last two years was presented to the Legislature. Your humble friend went before the Committee of Agriculture, and succeeded in having passed a much better, infinitely better—atlthough not yet what is needed—State veterinary sanitary law. A special law to co-operate with the Bureau of Animal Industry and to deal with contagious diseases of live stock outside of Missouri, such as Texas fever, pleuro-pneumonia, etc., was also presented to the Legislature at the same time. It was modified a little and passed the House with but five votes against it, I think. It then passed two readings in the Senate and would undoubtedly have become a law had not the Senate adjourned in a wrangle over a railway act, with a great deal of unfinished business, among which was this act.

Surely this shows an appreciation of veterinary science in a very short time. For in April, 1885, nothing at all existed as a veterinary sanitary law, and nothing was known in that line among the legislators. Dr. Trumbower at Fulton during the pleuro pneumonia outbreak was the first to open the eyes of the people of Missouri regarding veterinary science as useful to save the country many almighty dollars. In this new law the legislators not only provided for the salary of the State Veterinarian, but also appropriated this year $2,000 for his traveling expenses.

Nor is this all. In response to a plea for the study of the obscure diseases of our live stock the Legislature appropriated $5,000 for the equipment, etc., of a laboratory for the State Veterinarian. This is all that was asked. The laboratory will soon be equipped now. It consists of six fine new rooms for small and large animals and for work in the new horticultural building of the State University (agricultural college farm).

And besides all that, a great pressure was brought to bear on myself and others to establish a veterinary college at this point in connection with the medical school of the State University. Here I was placed in a rather embarrassing position, as very influential friends of this institution and of myself, including the president, were the instigators of the plan.

The first reply to the matter was that no such college should exist unless it had a full faculty and hospital accommodations. To this they (the instigators) agreed, but they thought it would cost comparatively little. I then wrote an estimation of the cost, and of course it was thousands of dollars above the supposed cost of the contemplated institution. But even this, it was urged, might be provided for by the Legislature. I feared, however, that it would jeopardize other demands. At last the State Veterinary Association had a meeting at Columbia and the subject was laid before this body by the most forward supporters of the plan.

The matter was discussed in a friendly spirit by the medical faculty, the President of the University and the members of the society. Finally, on motion, the chair appointed a committee to investigate the question and report to the University authorities. The report was adverse to the plan and this ended the matter. I may say here, in justice to myself, that I emphatically refused my consent to establishing a college with five or six physicians as teachers and only *one veterinarian*, although in my position I could not present any serious objection to the State establishing such a college if she did it on a solid basis. But I see no need for such an institution here under the circumstances.

Now this attempt on the part of the University was thought by some of my friends to be my work. If it was, I must say the work was accomplished without any personal motives and without any effort upon my part towards that end. It shows one thing, however, no matter what the good veterinarians of Missouri and other places may think; it shows that the high educational centres, supported by an agricultural State, have understood that veterinary science is useful and honorable, and that it should be fostered by all means. We have in this State a few graduates only.

In some cities there seems to be a sufficient number. But all are hard working and skillful veterinarians who are daily bringing the profession to a higher and higher professional and social standard.

Pardon this long letter. I felt that you should know that Missouri is responding to the demand of the REVIEW, "raise the profession to where it properly belongs."

Pardon me also for personal allusions. I have been so closely connected with all that I explain herein that I could not help them. If you find anything in this worthy of publication you may extract them for the VETERINARIAN REVIEW. Yours truly,

P. PAQUIN.

P. S. A chair of comparative medicine (pathology of animals compared to man, etc.) has been established at the University Medical School as a result of discussions above stated.

GUESSING AN OLD MARE'S AGE.

Editor American Veterinary Review:

I enclose herewith a slip of paper for publication in the REVIEW, interesting from the fact that it shows how difficult it is for persons to tell the exact age of a horse after having passed into its teens or through them. The subject was a bay mare that I have known from colthood and know her to be at least 29 years of age, she having been broken about the beginning of the war, 1861. She was then owned by the father of the present owner, near Hightstown, N. J. She is now in the son's possession at Asbury Park, N. J., and I had her brought to the meeting of the New Jersey Veterinary Medical Association for the purpose of having the veterinarians look at her mouth and tell her age. Twelve of those present looked at her mouth and wrote the age on a slip of paper, so that no one knew what any other marked until all who wished had given an opinion, when the slips were opened by myself, and they read as follows:

16—Non-graduate.
16—Graduate of the New Jersey School, of Dr. Smith, of Trenton.
27— " " " " " " " " " "

21—Graduate of old Philadelphia School, of Jennings and others.
23— " " Columbia Veterinary College.
22— " " " " "
22— " " American " "
25— " " " " "
24—Non-graduate.
26— " "
17— " "
26— " "

Of those who gave an opinion four were graduates of colleges and one of the New Jersey Veterinary School, which was located in Trenton some years ago by Dr. Smith. All were practical veterinarians or graduates.

The owner says the mare is 30. I think her but 29, as I well remember her as a colt being just broken at the beginning of the war. Very respectfully yours, W. B. E. Miller, D.V.S.

ON VETERINARY LEGISLATION.

Editor Review:

In the last number of the Review Dr. Peabody has considerable to say about veterinary legislation, much of which is all right in its place; but there is one portion of his letter that I consider is intended as a whack at me. I refer to the second paragraph.

While I cannot deny the fact that I have too often occupied the pages of the Review on this subject, I can and wish to most emphatically deny that I have ever done so "to get a little cheap notoriety." It has neither been cheap or satisfactory, but the reverse, and is now to me a most unpleasant subject—so much so that "veterinary legislation" acts on me as a strong emetic. This acknowledgment will no doubt be gratifying to those gentlemen (?) who were instrumental in making it so, but let me say right here that "those who laugh last laugh best." If the institution known as the New York County Veterinary Society cannot be called a *mill*, what else can you call it? It is run by two or three men for the sole purpose of selling so-called diplomas or certificates. They examine anyone they please, give no lectures, graduate anyone they think proper in thirty minutes for a good

money consideration and divide the larger portion between the so-called examiners.

It is true the law as passed is a miserable failure; but why? Because the profession of this State is cursed with men who are lost to all sense of feeling, I was going to say, but they never knew what that was. I tried to do some good. I failed. Why? I ask again. Because I never had the hearty support of the profession. Why I cannot tell, except that many might have looked at it in the same light that Dr. Peabody appears to, and because of such apathy they allowed a few to have their own way.

Better men than I have failed with such odds, but such a failure should show a bitter lesson, resulting perhaps in unity of action in the future, and hence more good may result from what I tried to do—not that I wish to claim all the credit (?), and I would that none of it fell to me—yet I did work, and for what I thought a good cause, but not for "cheap notoriety." Yours very truly,

W. H. Pendry.

SANITARY REPORTS.

MANITOBA, CAN., VETERINARIAN'S REPORT FOR 1886-7.—REMARKABLE DECREASE IN DISEASE.

Mr. W. McEachran, M.D., V.S., Consulting Veterinarian, has submitted his report for the year ending June 30, 1887, to the Provincial Department of Agriculture. The following extracts show most conclusively the benefits derived by the province from the strict precautionary measures taken by the department to prevent the spread of disease, and constitute in themselves the best defence that can be offered the public for the stringency of the rules enforced.

Mr. McEachran, in opening his report, expresses pleasure at the absence, during the past year, of any serious outbreak of diseases of an epidemic or endemic nature; only sporadic cases having required to be dealt with.

Referring to glanders, he says: I have to report a satisfactory reduction in the number of cases of this most troublesome

pest in every district throughout the province, with the exception of Portage la Prairie, where there has been an increase from four cases in 1885–6 to twelve in 1886–7. This increase is to be accounted for by the unrestricted importation of ponies from the Territories and Montana in bands, by which, to my own knowledge, cases of glanders have been brought. The total number of horses lost or ordered to be destroyed by the district veterinarians was 66, being a decrease of 39 cases as compared with 1885–6, and 100 cases as compared with 1884, the first year in which a veterinary sanitary service was in operation. This I consider a good showing, and illustrates the benefit to the province, for the number and value lost is reduced about two-thirds, while had this disease been allowed to have full sway there is no estimating the loss, which would have been enormous and constantly increasing. I am pleased to have to report the fact that stock owners are thoroughly alive to the importance of stamping out this disease, and in the majority of cases report themselves, not waiting, as was at one time the custom, until some of their neighbors drew attention to the presence of the disease. It is a satisfaction to be able to report no cases of prosecution in the courts. The cases of glanders were distributed over the province in the following districts as compared with last year:

DECREASE AND INCREASE.

	1885-6.	1886-7.	
Brandon and Dennis	24	13	dec., 11
Dufferin and Rock Lake	19	15	dec., 4
Manchester and Carillon	16	9	dec., 7
Selkirk and Marquette	13	5	dec., 7
Minnedosa	8	2	dec., 6
Souris and Turtle Mountain	5	3	dec., 2
Lisgar and Gimli	5	0	dec., 5
Portage la Prairie	4	12	inc., 8
Shoal Lake and Russell	4	3	dec., 1
D'Iberville and Morris	4	0	dec., 4
Norfolk	2	4	inc., 2

Of these, 63 cases suffered from glanders and three cases from farcy; 61 cases were quarantined as suspected, of which 21 were destroyed, the balance being released. This, no doubt, will inspire confidence in the owners of stock, as it shows that veterin-

arians destroy animals only after carefully considering the cases and arriving at a proper diagnosis.

Referring to mange, Dr. McEachran says the disease has been reported from but few districts, being nearly the same as last year. Being amenable to treatment, the disease is easily controlled. The districts from which it was reported were as follows: Brandon, 6; Portage la Prairie, 24; Dufferin and Rock Lake, 2; Selkirk, 1; Shoal, 1; total, 34.

In regard to tuberculosis, the report points out that but little is known of the disease in this country as yet. But as a natural consequence of the importation of fine in-bred cattle, it will gain foothold here, as in other countries, at no distant date. It is suggested that veterinarians be instructed to report all cases which may occur within their private practice, as it is not an affection that will attract much attention except in thoroughbred herds.

Of actinomykosis (big jaw) only four cases were reported during the year. This is a disease which only occurs in sporadic cases, and is contagious only to a slight degree.

Referring to the general health of stock, Mr. McEachran says: I have to report that the general health of stock during the past year has been good. There have been only the ordinary diseases among horses; strangles has prevailed during the spring months to some extent in the counties of Lisgar and Norfolk, but with comparatively little mortality. A good many cows were said to have slipped their calves in the Elm River district, but this was found to be rare and due in all cases to carelessness on the part of the owners of stock in not separating the cattle.

REVIEW AND NOTICES.

HINTS ON THE BREEDING AND REARING OF FARM ANIMALS. By Prof. WALLEY.

A neat little book on this important subject, being a paper read by the author before the Fife Farmers' Club. It contains some excellent points relating to breeding and rearing, and constitutes an excellent addition to the literature of zoötechnic.

THE HORSE, COW AND DOG, WITH ANIMAL CHARACTERISTICS.
By the same.

To his abilities as a writer on important professional subjects Prof. Walley adds those of a poet. Whoever will read his "The Horse's Troublous Life," "The Life of a Dairy Cow," and "The Life of a Dog," will pass interesting hours, and, like the author, find valuable subjects of thought, so well and kindly expressed in "Animal Characteristics."

THOMAS' MEDICAL DICTIONARY.

The well-known veterinary publication house of W. R. Jenkins has sent us a copy of this new and excellent book. It comes before the medical profession with the design of supplying the wants of those who commence the study of medicine and affiliated sciences, and, though seeming to contain but few medical veterinary terms, will no doubt prove very advantageous to the veterinary student. The book is handsomely brought out and the price so low as to bring it within reach of a small-sized purse.

SOCIETY MEETINGS.

TWENTY-FOURTH ANNUAL MEETING OF THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

The Comitia Minora of this Association was called to order at 10.30 A. M., at the American Veterinary College, by the President, Prof. A. Liautard.

Members present: Drs. Liautard, Huidekoper, Zuill, Dixon, L. McLean, and Michener. Absent: Drs. Robertson, Lyman, Field, Ross, Osgood.

Eleven candidates for admission to membership were recommended by the Comitia Minora.

The regular meeting met at 11.45 A. M., with Prof. Liautard in the chair. Nearly fifty members answered roll call. The minutes of last meeting were adopted, with but one exception: the Secretary having recorded Dr. Salmon as being elected an *honorary* member, while he was elected an *active* one. The minutes of the Comitia Minora were also read and approved.

The Committee on Intelligence and Education gave very interesting reports from Drs. Paquin of Missouri, and McInness of South Carolina. The report was accepted and placed on file.

The College Committee made a report of progress, stating, through its chairman, Dr. Hoskins, that they had strong reasons for expecting a speedy and favorable termination of its labors.

The Committee on Diseases, through Dr. Zuill, reported at length and stated the prevalence and extent of chicken cholera, hog cholera, rabies, anthrax, glanders and farcy, tuberculosis, contagious pleuro-pneumonia, and also as the Committee incline, the non-contagious disease, cerebro-spinal meningitis. The Committee received a vote of thanks, and their report was ordered on file.

The Prize Committee were at first unable to decide upon the merits of the two papers presented. Dr. L. H. Howard was added to the Committee, in the absence of J. C. Meyer, Sr., and the papers referred back for a report at this meeting.

The Committee on Army Legislation presented a printed bill, but nothing more was done by the Associatiou than to accept the bill. The Committee was continued.

By direction of the Association, the Secretary cast an affirmative vote for the following candidates for admission to membership: Drs. T. W. Moyer, Werner, Turner, Lamberton, Barrow, Strange, C. C. McLean, Blank, Connell, Sellers, and Farnsworth.

The Treasurer's report was then audited and received.

There were nearly twenty-five new applicants for membership.

The Prize Committee again reported, and were not in favor of granting the prize to either essayist. On motion of L. McLean, seconded by Dr. Clements, the report was received.

Election of officers for the ensuing year resulted as follows:

President—Prof. R. S. Huidekoper.

Vice-President—J. C. Meyer, Jr.

Secretary—C. B. Michener.

Treasurer—Jas. L. Robertson.

Board of Censors—Drs. Dixon, Lyman, Hoskins, Zuill, L. McLean, Ross and Bryden.

A recess of half an hour was then taken, after which Dr. Michener offered his alteration of Section 1, Article IV., of the By-Laws. This was carried, and in the future *none but graduates* will be admitted to the Association.

By vote, the papers offered for prizes were taken up and acted upon by the general meeting. A ballot taken resulted in granting the prize to "Trianon," —Dr. John Wende, of Buffalo, N. Y.

Dr. L. McLean here gave notice that he would at the next meeting offer an alteration of Article X., Chapter VII., of Constitution, making it read as follows: "Hereafter, prizes will only be given to the best original paper read and defended by the author at the annual meetings."

Bills presented by the Treasurer were ordered paid.

There were three casting-tables presented to the notice of the Association, and no one of them could be officially endorsed. There was a general opinion among members that one of these was far superior to the other two.

On motion of Dr. Martinet, it was decided to hold the semi-annual meeting next March in Baltimore, Md.

A somewhat spirited discussion followed upon cerebro-spinal meningitis, which elicited much difference of opinion as to its pathology, means of spreading, etc.

The Secretary had other papers in his possession, but owing to the lateness of the hour they were not read.

The Association then adjourned.

In the evening a banquet was held at Clark's. The following toasts were offered and responded to:

"The President of the United States," by Dr. Williamson Bryden, of Boston.

"Our Profession," by Prof. Liautard.

"Our Sister Profession," by Dr. Raymond, of Brooklyn.

"The Bureau of Animal Industry," by C. B. Michener.

"Our Legislature," by Hon. J. Cantor, N. Y.

"The Press," by A. C. Hummell, M.D., Pa.

"The Ladies," by Dr. Pendry.

Informal speeches, interspersed with excellent songs, concluded a very pleasant meeting.

C. B. Michenrr, *Secretary.*

NEW JERSEY STATE VETERINARY SOCIETY.

Twenty-four graduates, fifteen of whom had been members of the old Association, have assisted in organizing a New Jersey State Veterinary Society, to which *only graduates in good standing from some veterinary college or university having power by law to grant diplomas are eligible to membership.* Every graduate known in the State was duly notified of the action about to be taken, and a meeting was held August 4th, 1887, at the office of Dr. William Herbert Lowe, Paterson, New Jersey, when officers were elected and the organization completed.

The Society proceeded immediately to comply with the terms and provisions of the act of the Legislature for the promotion of veterinary science and art. The officers and members present signed and sealed the certificate of incorporation which had been previously drawn by Senator Griggs, after which the document was forwarded to the Secretary of State at Trenton, as required by law. Six of the incorporators are graduates of the American Veterinary College; three are graduates of the Columbia Veterinary College; two are graduates of the Ontario

Veterinary College; two are graduates of the Chicago Veterinary College, and one is a graduate of the Royal College of Saxon.

The following are the officers elected at the meeting held in Paterson, August 4th :

President—J. C. Corlies, D.V.S., of Newark, N. J.

First Vice-President—Edwin R. Voorhees, D.V.S., of Somerville, N. J.

Second Vice-President—Eldon L. Loblein, D.V.S., of New Brunswick, N. J.

Secretary—William Herbert Lowe, D.V.S., of Paterson, N. J.

Treasurer—Ludwig R. Sattler, D.V.S., of Newark, N. J.

Censors—Andrew Sherk, V.S., of Newark; Joseph Nayler, D.V.S., of Jersey City; Elmore R. Mercer, D.V.S., of Montclair; Matthew A. Pierce, D.V.S., of Paterson ; and Robert W. Carter, V.S., of Jobstown.

All except two of the newly elected officers had been members of the old Association. They had disconnected themselves from it simply because they did not consider that it would be either advantageous to them or to the veterinary profession of New Jersey to be associated with the non-graduates who were members. It appears that recently the non-graduates have taken a more active part in the affairs of the Association than the graduates, for at a recent meeting, it is alleged, four of the officers elected were non-graduates.

The following distinguished gentlemen were proposed by the Secretary for honorary membership:

Prof. Liautard, Dean of the American Veterinary College.

Dr. Ezra M. Hunt, Secretary of the New Jersey State Board of Health.

Prof. Rush S. Huidekoper, Dean of the Veterinary Department, University of Pennsylvania.

William L. Zuill, M.D., D.V.S., of the same institution.

Dr. Salmon, Chief of the Bureau of Animal Industry, Washington, D. C.

Prof. Chas. B. Michener, of the American Veterinary College.

Prof. Smith, Principal of the Ontario Veterinary College.

Prof. James Law, of Cornell University.

Prof. C. P. Lyman, of Harvard University.

Prof. D. McEachran, of Montreal Veterinary College.

Dr. George Fleming, of London, England.

Prof. James L. Robertson, of the American Veterinary College, was proposed by Dr. Pierce.

Prof. Baker, Principal of the Chicago Veterinary College, was proposed by Dr. Voorhees.

Prof. Dr. Leisering, Geh. Med. R., Germany, was proposed by Dr. Sattler.

All the above gentlemen were unanimously elected to honorary membership.

The objects of the new Society, as stated in the certificate of incorporation, are: "The promotion of fraternal feeling among its members; the welfare of the veterinary profession in general, and of New Jersey in particular; the advancement of the science and art of veterinary medicine and surgery; aiming to protect the rights and privileges of practitioners, and to elevate the standard of the profession by scientific intercourse."

President Corlies appointed Dr. Krowl, of Passaic; Dr. De Clyne, of New

Durham; Dr. Pocock, of Pennington; Dr. Loblein, of New Brunswick, and Dr. Voorhees, of Somerville, a Committee on By-Laws.

The members decided to hold the next meeting in Newark either in September or October, when the report of the Committee on By-Laws will be acted upon, and such other business transacted as may come before them at that time. The time of calling the meeting was left in the hands of the President.

WILLIAM HERBERT LOWE, D.V.S. *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The eleventh regular meeting of the New Jersey Veterinary Medical Association was held at the Hotel Asbury, Asbury Park, Thursday, August 11th.

The meeting was called to order at 12 o'clock, noon, by the President, Dr. J. W. Hawk, of Newark.

The roll was called by the Secretary, and the following gentlemen answered to their names:

Drs. J. W. Hawk, of Newark; W. B. E. Miller, of Camden; W. P. Smith, Trenton; D. J. Dixon, Hoboken; W. H. Cooper, Salem; J. C. Dustan, Morristown; W. B. Hayden, Newark; B. F. King, Little Silver; T. C. Sanford, Asbury Park; J. Kehoe, Lyndhurst; J. C. Higgins, New Brunswick; R. E. Stanwood, Freehold; W. W. Rowland, Jersey City; A. C. Doyle, Hightstown; A. T. Sellers, Camden.

Reading of the minutes; adopted as read.

The President excused himself from a lengthy address.

There was no unfinished business. There was no report from the Treasurer, as he was absent.

A recess was taken for the purpose of a report from the Board of Censors and Trustees.

There being no full board, the President appointed Drs. D. J. Dixon and Wm. P. Smith to fill vacancy.

The meeting being recalled, the chairman made the following report: That they had examined Dr. A. T. Sellers, of Camden, and unanimously found him qualified to become a member of this Association, and that the examination of Mr. Goble had been unfavorable.

Moved and seconded, that the Secretary notify Mr. Goble of his rejection, with an invitation to come before them again.

The essayist, Dr. D. J. Dixon, was excused on the ground of not having been notified by the Secretary.

Remarks were made by Drs. Dixon, Miller, Dustan, Sanford, Higgins and others.

The *World* had recently contained an article relating to the Association, which was read by the Secretary and condemned by the Association. Dr. Higgins moved that an article in rebuttal be sent to that paper, and that a committee be appointed to make a report. Seconded and carried. The President appointed Drs. Miller, Dixon, Higgins and Cooper.

APPLICATIONS FOR MEMBERSHIP.

Dr. Miller proposed the name of Dr. Wm. Dimond, of Trenton.

Dr. Smith proposed Albert Brown, of Winsor.

MISCELLANEOUS BUSINESS.

The Secretary read the resignation of E. L. Loblein, of New Brunswick, and also a letter from Dr. Lowe tendering the resignation of several members.

EXPELLED.

Jas C. Corlies, Wm. Herbert Lowe, L. R. Sattler, M. A. Pierse, E. R. Mercer, J. Nayler, and J. Newton Krowl. (All but two in arrears).

Dr. Miller moved that the Secretary notify those who have paid their dues up to date of the acceptance of their resignations; and those who are in arrears, that by paying up their resignationwill be accepted, otherwise to be rejected and take the regular form of expelled members. Seconded and carried.

The meeting then adjourned for dinner. At 4 P. M. the President recalled the meeting to order.

The Chairman of the Committee made the following report for the press:

ASBURY PARK, Aug. 11th, 1887.

The Second tri-annual Meeting of the New Jersey Veterinary Medical Association for the year 1887 was held at the Hotel Asbury, Asbury Park, on Thursday August 11th, 1887, twenty-seven members and visitors being present from the several sections of the State, and much interest being manifested in the proceedings of the meeting.

Interesting papers were read and discussions thereon participated in by quite a number of the members.

There were two new members admitted and several applications for membership were received. The Society is now in the fourth year of its existence and is in a flourishing condition and doing good work for the promotion of veterinary science.

Its membership is composed of regular graduates and such practitioners of veterinary science as are able to pass a competent examination before a Board of Censors elected by the Society.

It is the first society legally chartered by the Legislature of New Jersey, and is known and recognized as such by the officers of the State Government and by the citizens at large.

After the regular order of business had been gone through with, the members sat down to a sumptuous repast to which all present did ample justice. The next tri-annual meeting will be held in New Brunswick on the second of December next at which interesting papers are expected, including one each from Prof. Rush S. Huidekoper, Dean of the Faculty of the Veterinary Department, University of Pennsylvania and Prof. Frank S. Billings, Veterinarian of Nebraska.

Dr. Dustan moved to elect Dr. Cooper to fill the vacant Treasurership. Seconded and carried.

President appointed Dr. A. T. Sellers next essayist.

Moved and seconded to hold our next meeting at New Brunswick. Carried.

President appointed Dr. Higgins a committee of one to make arrangements for next meeting. Adjourned to meet Thursday, December 2d, 1887, at New Brunswick.

W. H. COOPER, Secretary, Salem, N. J.

NEWS AND SUNDRIES.

Disease in Michigan.—A dispatch from Detroit last Saturday stated that "Meat-inspector Sullivan says there has not been a case of Texas or splenic fever among the cattle of Detroit. He has examined nearly all the cases of reported sickness, and pronounces them simply 'red water,' which is a malady resultant from the severe drought. About one-half of the meat eaten in Detroit is Texas beef."—*Nat. Live Stock Jour.*

Contagious Diseases in Illinois.—Word comes from Quincy, Ill., that "Texas fever developed in a herd of 250 cattle, pastured south of here. It is supposed to have been introduced by a car-load of western cattle received August 25th. Thirteen native cows have died, several are missing, and others are sick. A strict quarantine has been established."

It is stated that "hog cholera is becoming a very serious thing in Henry County, Ill. The disease exists in Kewanee, Asco, Loraine, Edford, Phenix, Andover, and Wethersfield townships. Thousands of dollars' worth of hogs have died, and farmers in Kewanee and Wethersfield townships, where the disease is of a more virulent nature, are losing hogs at the rate of from ten to twenty head a day".—*Nat. Live Stock Jour.*

Foot and Mouth Disease.—A dispatch from Dakota last Thursday, stated that "health officers who examined the diseased cattle at Richardson say that suspicious symptoms attacked two herds. They point to foot-and-mouth disease. The doctors say there is no pleuro-pneumonia. Local stockmen are excited. The affected cattle are scattered over several miles of territory. Efforts will be made to keep the malady from spreading,"—*Nat. Live Stock Jour.*

Territorial Veterinary Surgeon.—Dr. A. J. Chandler, of Detroit, Michigan, has been appointed Territorial Veterinary Surgeon of Arizona. Dr. Chandler is a graduate of the Montreal School of Veterinary Surgery, and has had a very extensive and successful practice in Michigan for many years, which he is now forced to relinquish on account of ill health, which he believes he can escape in a less rigorous climate.

AMERICAN VETERINARY REVIEW,

NOVEMBER, 1887.

EDITORIAL.

VETERINARY LEGISLATION.—Our columns always open to scientific subjects and questions of professional importance—closed to personalities. BACTERIOLOGY, HOG CHOLERA AND TEXAS FEVER.—How specialists are born—the labor required to become a specialist—the feelings of hostility that may arise—difficulties in the way of agreement—opportunities for disagreement—Drs. Billings and Salmon as investigators—their labors in hog cholera—Dr. Billings' just claim to priority—his last discovery in Texas fever—his letter—one is well, but why challenge all around—a call for another *Pouilly Lefort* experiment. VACCINATION IN ANTHRAX.—Director Nocard's statistics—their weight and their significance—why don't we try them? DR. SALMON ON PLEURO-PNEUMONIA.—A call, not for support only, but to guard against too much confidence in what has so successfully been already done—his staff in New York—slow work, but sure, we hope—Dr. S's letter from the *Breeder's Gazette*. FALSE FEATHERS.—That which broke the camel's back—an imposter exposed—we are ready to keep doing it, as a protection to the dignity of our profession. THE ARMY VETERINARIANS.—Of course, the United States Veterinary Medical Association missed a good opportunity—Dr. O. Schwartzkopf on army veterinarians at home and abroad—his suggestions and conclusions. UNITED STATES VETERINARY SANITARY ASSOCIATION.—Its third meeting in Kansas City.

VETERINARY LEGISLATION.—It has been our desire, since engaging in the publication of the REVIEW, to extend the freest welcome to and encourage the largest liberty by our correspondents in the discussion of questions of veterinary science and practice, and we have always been glad to give currency to the views and experiences of our brethren in the profession. But it has been equally our aim and desire to guard our magazine against becom-

ing a medium for the expression of private pique or a channel for the circulation of offensive personalities. It is, therefore, with great regret that we refer to the insertion in our last number—in which it found its way by some inexplicable inadvertence—of a communication in which our rule in the latter regard is obviously violated.

We wish to say, further, that inasmuch as the discussion of the subject of veterinary legislation seems to have become more a question of personal feeling and motive than of the general interests of the profession, we feel constrained for the present to close our columns against any further communications having that for their topic.

Bacteriology, Hog Cholera and Texas Fever.—All the sciences have attractions for the seekers after knowledge, and each, separately, possesses some characteristic features which, in the view of the student who resolves upon the mastery of its details, confers upon it a special interest and a claim to peculiar and paramount consideration. Thus, in the view of the anatomist, there is no department of medical study possessing an interest or fascination comparable to that of animal structure; and a similar claim comes from the pathologist, the surgeon and the obstetrician, each claiming for his favorite specialty the place of foremost value and concern. It is to this trait of human character that the existence of specialties in medical science and the prominence sometimes acquired by specialists in medical study and practice must be ascribed, and among these, preëminently, the experimentalists and others who occupy the field of biology and bacteriology. The difficulties encountered and the obstacles to be overcome in securing anything like the mastery of the matters included in the investigations involved in this line of inquiry, joined to the zealous and enthusiastic temperament pre-supposed as characterizing the ardent and earnest workers among the intricacies and obscurities of such subjects, have naturally generated amongst them no small degree of jealousy, and an amount of competitive intolerance quite beyond the bounds of philosophic calmness and scholastic fairness. The feelings of hostility which have

been generated among those who should rather become brother scientists than disputatious antagonists cannot prove otherwise than detrimental to the interests they are all presumably anxious to promote. For if the views of each are discredited by a rival, why may not the entire sum of their theories and experiments be discredited by some third objecting party? Such a reflection naturally arises from a view of the discrepancies noticeable in the published views of some of the most able and eminent observers in veterinary science on this side of the Atlantic, in reference, most especially, to the etiology of hog cholera.

We have made room, quite as liberally as the limitations of our space will allow, to such communications on this subject as we have been able to obtain from the pens of Dr. Billings and Dr. Salmon, and the long series of articles contributed by these gentlemen must now be familiar to our readers. Though they are indefatigable investigators, they have still, so far as we have been able to gather from the writings of Dr. Billings, quite failed to agree upon the point of the true origin of that disease; if, indeed, their disagreement be not rather upon the question of priority of discovery. Dr. Billings, while giving due credit to Dr. Detmers, who from lack of proper instruments was unable positively to realize the nature of his discovery, claims for himself, and we believe rightly, and to his researches, the position of first discoverer. The papers to this effect have already appeared in the REVIEW and due credit must be given to him for his work. The position may need confirmation and others may come forward to corroborate it in the same manner. And now it appears that the Doctor's energy and enthusiasm are not yet satisfied by this first success in relation to hog cholera. We have just received from him a letter in which he claims a second discovery of no less importance in a scientific view. The true nature of Texas fever, in the opinion of Dr. Billings, is no longer a mystery. He writes thus:

LINCOLN, Neb., Septt. 16, 1887.

Editor of American Veterinary Review, New York City:

MY DEAR SIR—Herewith I desire to announce to the veterinary and medical profession the first discovery of the germ of Texas or Southern cattle fever. It is a bacterium so closely resemblimg that of swine plague (hog cholera) that it

cannot be differentiated from it under the microscope. I have found it in an absolutely pure condition in the blood, bile and tissues of organs of cattle that have died from the disease. In fact I have proved its specific nature in every way.

1. Its presence in the tissues of cattle diseased with Texas fever, killed a few hours before death.

2. By pure cultivations from those same tissues.

3. Its pathogenetic action on ground squirrels, which it kills in forty-eight hours.

4. By inducing Texas fever in cattle, and the demonstration of the same germs again in their tissues, and by cultures from the same.

I have said that it cannot be distinguished from the germ of hog cholera under the microscope, nor by its growth on agar-agar, or in boullion, but on potatoes it at once differentiates itself, being of a delicate straw color, while that of hog cholera grows with a sort of coffee-drab color—a friend suggests the term of "boarding-house coffee" as the most descriptive. In gelatine I cannot yet test it, as my rooms are still too warm.

That this is the first discovery of this germ is shown by a glance at the literature. Detmers has found a bacillus. See Report of Department of Agriculture, 1884, p. 431, and that of 1880–'81, p. 296, w plate.

Salmon describes a "*diplococcus*,"—see report of 1883—*that it has a "figure 8 form"* and "*without any power of movement*," p. 35.

This germ is not a "diplococcus;" it has not a "figure 8 form," *and it has independ ınt movement, as has that of hog cholera.* A fuller description of this germ will follow in due time.

I remain, sir, yours very truly,

FRANK S. BILLINGS,

Director Patho-Biological Laboratory, State University, Lincoln, Neb.

While we take great pleasure in publicly acknowledging our appreciation both of our correspondent's work and that of his antagonist, we cannot help profoundly regretting the hostile disposition which has been generated in the course of their investigations, and especially that this antagonism should have gone so far as to have culminated in public challenges, issued through the daily press, by which public discussions are called for, in which the confirmation of their opposing views is to be sought for from a tribunal composed of men who know nothing of the subject. We are sure that this is a wrong way to discover truth, and one that can result in no profit either to the common welfare or to the subject in question. And an exchange brings us information of another emeute, in which the alleged discovery of a vaccine is placed in doubt and a public demonstration asked for. All this may be well in a sense, and no doubt it devolves on Dr. Billings

to substantiate his statement by a large experimentation, and no doubt make a new edition of *Pouilly Lefort* experiments by Pasteur, when his discovery of the vaccine for anthrax was mistrusted and denied.

VACCINATION IN ANTHRAX.—Speaking of this experiment, and referring to the advantages following the employment of vaccination against anthrax, Professor Nocard, in his chronic of the *Recueil de Medecine Veterinaire*, publishes a statistical table of the vaccinations practiced since 1881, both in France and in foreign countries, with the vaccine prepared at the Pasteur laboratory. The animals thus treated were, by his showing:

	Sheep.	Cattle.	Horses.
1881	74,551	7,231	242
1882	306,870	41,823	2,025
1883	335,330	32,230	1,346
1884	361,198	40,500	384
1885	401,625	41,982	1,298
1886	367,208	47,229	47,229

The result, ascertained and stated by competent authority in respect to more than one-half of the animals which had been treated, was a reduction of mortality in sheep from 8 to 10 per cent. before to less than 1 per cent. after vaccination, and in cattle from 5 per cent. to one-half of 1 per cent. The force of these irresistible facts ought to be more than sufficient to carry a conviction to every mind of the preventive value of the application of the plan of inoculation in bacteridian anthrax. The evidence already obtained in cases of the bacterian form of the disease is quite as strong. Will our veterinarians and our breeders ever learn the wisdom of putting it into practice in the United States?

DR. SALMON ON PLEURO-PNEUMONIA.—We copy in this number a letter from Dr. Salmon, the accomplished chief of the Bureau of Animal Industry, in relation to the progress of the work undertaken for the suppression of pleuro-pneumonia in the United States. The appeal of Dr. S. is a proper one, and the reasons he urges in its support are as forcibly stated as they are pertinent to the occasion. It is quite true that much has been done, but it is equally true that much still remains to be done.

The first appropriation of funds made by Congress seemed to be liberally large, but as the undertaking progresses, and looms up larger and larger, and continues to assume still increasing dimensions, it becomes more and more difficult to determine a limit for the final cost of the great and necessary enterprise. The officers of the Bureau of Animal Industry have now removed their quarters to the city of New York, which thus becomes a new centre from which to direct their widely extended operations, a step which will probably test their pecuniary resources to an extent beyond anything they have experienced in the past. Perhaps it is for this reason that the work of stamping out the disease has not yet been earnestly inaugurated in the metropolis and the circumjacent territory, where the disease has, to an indefinite extent, prevailed for years, but will now, doubtless, soon be subjected to a course of rigid inspection and vigorous attack. The active supervision of Dr. Wray, the chief executive officer, will soon declare itself, and it is certain that it will not be long before we shall hear news of active operations and their results. But our people and our Legislature, and the national Congress especially, must not be allowed to believe that what has already been granted is nearly sufficient. Pleuro-pneumonia *can be* stamped out from its old birth-place, and afterwards from the districts which have subsequently become infected. The practicability of this is easily demonstrated, but the indispensable condition is always present. Whatever the ordnance may be, money is the only available ammunition. Good veterinarians, willing to become faithful servants, are waiting for the opportunity to assist in the work, but their principal weapon of aggressive attack must not be withheld. Money must be forthcoming, we repeat, or the whole undertaking will abort. Of course there is no danger of its final abandonment, but it should be borne in mind that if only half done, and rallying time is allowed between the attacks, the expenditure will be certainly enhanced in the end. Spasmodic and occasional assaults will be of small account. Congress should be importuned and urged to *provide the ammunition* freely, if the good fight is to be pressed on to final victory. The following is the letter of Dr. Salmon, as printed in the *Breeders' Gazette :*

THE POSITION OF THE PLEURO-PNEUMONIA STRUGGLE.

To the Gazette:

The time has not yet come when those interested in the complete extirpation of pleuro-pneumonia from this country can suspend their exertions with the assurance that the achievement of this end is only a question of time. It is true that a great advance has been accomplished within the last year. For the first time an adequate appropriation has been made for this work, and authority has been granted to use this appropriation for slaughtering both diseased and exposed animals. The States in which pleuro-pneumonia exists have nearly all supplemented the National law by legislative enactments and by executive orders to such an extent as to make it possible to do effective work within their borders. This is notably true of the worst infected States.

The field work has been equally encouraging. Cook County, Ill., though more extensely infected than many people supposed, has been nearly freed from the contagion by the energetic and thorough measures adopted and enforced by Prof. Law with the co-operation of the State Live-Stock Commission. Maryland, for a long time one of the chief fountain-heads of the plague, has also been nearly freed from it by the active work of Dr. Wray and his assistants, with the earnest support of the Maryland Live-Stock Commission. New Jersey is in better condition than she has been for a long time, and New York State, outside of the great seaboard cities, is being rapidly freed from the contagion.

This is all very encouraging, but the work evidently was begun none too soon. The cases which were discovered last winter and spring in Boston show that already cattle were being run out of the infected district in Cook County before a thorough quarantine was established. The extensive outbreaks in the interior counties of Washington and Delaware, in the State of New York, which have recently been suppressed, demonstrate that the conditions favoring the dissemination of this disease have recently been rapidly increasing.

These facts are mentioned to emphasize the necessity that every stockman in the land should give his earnest support to the Bureau of Animal Industry in the desperate efforts that are required to stamp out this plague from its breeding places in our country. Neither a hundred nor a thousand men are sufficient to police this country so as to unerringly discover in their first stages the fresh outbreaks of our enemy. In both Washington and Delaware Counties considerable headway had been gained before the tronble was brought to the notice of the Bureau. I desire to press upon your readers, therefore, the necessity of reporting promptly the existence of any acute lung disease of cattle which attacks more than one animal in a herd.

A few days ago a gentleman of great experience in public life, and well known because of his labors in behalf of our agriculturists, remarked to me that he considered the effort to wipe out pleuro-pneumonia at once and for all time from this continent to be one of the grandest undertakings of the age. No doubt this estimate of the work is correct, and it is very certain that if successful it may be placed at the head of the works inaugurated in this country for the benefit of our farmers. But if it should fail from insufficient support, what a blot this would be upon the foresight and intelligence of our people!

Unfortunately there appear to be people in this country who consider it their mission to fight against the suppression of pleuro-pneumonia; who are so anxious to secure the preservation of this plague among our cattle that they have adopted the most disreputable methods of warfare in its favor. Misrepresentation and denial of well-attested facts, and the abuse of every one connected with the service, has been carried to such an extent and repeated so often that many of our farmers have been persuaded that a great fraud is being practiced upon them, and that no contagious pleuro-pneumonia exists in the country. Instead of recognizing the Bureau of Animal Industry as a friend, established at the request of stock-owners and for their benefit, such people have come to look upon it as an enemy preying upon their property. Nor can we forget that the agricultural editors of some of our great weekly newspapers, and the writers for some of our distinctly agricultural journals, are so blinded by jealousy, prejudice, and ignorance that week after week their columns are loaded with matter designed to obstruct this work undertaken for the benefit of the very class of our people with which they pretend to be in sympathy.

These facts must be borne in mind and this influence must be counteracted by those intelligent stockmen and writers who know the truth. The sympathy and support of our farmers are essential to the success of this work; but those of us who are engaged in hunting out this disease and in devising measures for hemming it in, and then stamping it out, have no time to explain the truth or deny the falsehoods.

No one expected that the present appropriation would be sufficient to eradicate pleuro-pneumonia from this country. A great deal has been done, however, and very much more will be accomplished before the end of the year. But the work must not stop with this year if success is to be attained. The worst infected center, and that the most difficult to deal with, is yet to be attacked. If the plague is entirely eradicated in two years or even three it will be better work than any other country can show.

Our beginning has been most promising, but the friends of this work should not forget that the needed amendments to the animal-industry law failed to pass at the last session of Congress, nor should they forget the opposition in that body engendered by the distorted statements and other influences of those who have fought pleuro-pneumonia legislation from the time it was first suggested. These amendments are needed this winter, as is also the authority to continue the work of extirpation during the next fiscal year. With the assistance of those who are most interested, namely, the farmers and cattlemen of the United States, there will be no difficulty in obtaining from Congress any necessary legislation; but if the stock-owners do not make their desires known to their representatives Congress can hardly be blamed for neglecting even this important question.

Washington, D. C. D. E. SALMON.

FALSE FEATHERS.—It is only within a comparatively recent period that the qualifications of persons alleging themselves to be competent to practice veterinary science were subjected to anything like a critical scrutiny on the part of the public. This

was due to the circumstance that any man was a horse doctor who chose so to denominate himself, and there were no veterinary schools in the country really possessing an established title to public recognition.

That time is past. Since then, colleges of veterinary science have been established in the United States, which by the honesty and thoroughness of their work have made for themselves a reputation and a credit as strongly established as they were honorably acquired, and a name and recognition not at home, merely, but among the older institutions of Europe. And there has been no failure on the part of their graduates in readily compelling the confidence of a discerning public by testing to the full their proficiency and their knowledge in the calling they have chosen. The extent of our broad territory has been no bar to the diffusion of the influence exercised by these institutions, and the success of their graduates in winning renown and the rewards of skill and faithfulness, has been reflected upon them until their name and fame have become familiarly known throughout the land. No one will be surprised, therefore, to learn that mendacious persons are to be found who have availed themselves of this circumstance, and falsely claiming these institutions for their alma mater, have traded upon their repute to impose upon the public with spurious claims. Under these circumstances, it seems to become the obvious duty of those who have it in their power to do so, to warn and guard a cheated public against such disgraceful impostures and unscrupulous misrepresentations.

With the design of aiding in the exposure of these deceptions, we began the publication some time ago, and design to continue it yearly, of the names of the *regular* graduates of all the veterinary schools on the continent, as we find them *officially* published by their officers. We are sorry to say that our object has not been fully accomplished, and that impostors claiming to be graduates are still occasionally making their appearance in various parts of the country, robbing the people of their good money and often injuring, by their absurd treatment and worthless nostrums, valuable animals whose lives and services, but for such quackery, might have been longer continued to their owners.

The title of one of the oldest veterinary schools of the country, enjoying as it does a national reputation (the American Veterinary College), has often been thus stolen and misappropriated, the last case of this kind being brought to our notice by the following business card, which was forwarded to us by a Minnesota practitioner:

Graduate of the American Veterinary College N. Y. City.

THE FAMOUS

VETERINARY

SURGEON AND PRACTIONER*

Among the Equine Aristocrats of the Northwest,

DR. HIRAM A. KENNEDY

Is without a doubt the most Popular and Scientific Vetinary* Physician and Surgeon now on on* record. His success in the parctice* of Medicine among the Domestic Animals excells* all Practitioners we ever saw. It affords us much pleasure to recommend the Doctor to all who desire his services.

P. S. Reserve for future reference.

Address Minneapolis, Minn

Office at 588 6th Ave. N.

S. N. Braley, M. D. & V. S. Washington, D. C.
John Hayes, M. D. & V. S. Detroit, Mich.
Prof. John Wilson, Ann Arbor, Mich.
A. E. Cox, Ausin,* Minn.
Chas. H. Coats,* Austin: Minn.

We can suggest but one mode of correcting this evil. Let every practitioner who becomes acquainted with facts of this kind address to us a letter of inquiry as to the true graduation of the claimant, and if it is proved that the claim is a false one, let the culprit be made to feel the weight of the laws designed for the punishment of guilt. That a non-graduate should work and earn his living in a professional manner, may perhaps be tolerated, but that an imposter, covered with the lion's skin and at the same time showing his ears, should be permitted to impose on the public, and at once disgrace a noble profession and discredit a reputable institution, is something that no honest man

* Credit is due some *graduate* for the orthography in this card. We are not entitled to it.

can sanction by his silence, of whatsoever school he may be a graduate.

The "famous Veterinary, Hiram A. Kennedy, Surgeon and Practioner," is an impostor, and we shall feel it to be our duty to say publicly as much of any other man who sees fit to assume a title to which he has no claim.

The Army Veterinarians.—The failure of the last meeting of the United States Veterinary Medical Association is a circumstance to be truly regretted, especially in view of the loss of the valuable papers prepared for it, that failed to see the light.

Amongst those which remained on the table of the Secretary was one on the "Necessity of an Organized and Elevated Veterinary Medical Corps in the United States Army," by O. Schwartzkopff, D.V.M., Junior Veterinary Surgeon, 8th U. S. Cavalry.

The paper is too voluminous for publication entire, and we can give it but a brief reference. A few remarks upon the general condition of the veterinary department in the army of the United States is followed by a long examination of the same department in the armies of the various countries of Europe. Those of England, France, Germany, Italy and Russia are successively brought into comparison, and the opinions of many commanding officers of the American Army are quoted as suggestive of the necessity of reform in ours. The paper concludes with suggestions as to the proper organization of this, thus far, neglected department of our own army.

The subject of veterinary army reform has always found hospitality in our pages, whatever suggestions our correspondents may have had to offer having been always laid before our readers. The project of Dr. Schwarzkopff commends itself to us, therefore, through our general sympathy with the subject, and for this reason alone, if for no other, we would give it place. But aside from this, the fact of his being an old army veterinarian abroad, and of having also been engaged in the American service for some length of time, should give additional weight to his suggestions, as being the fruit of much and varied experience. They should therefore commend themselves to the serious consideration

of those to whom his report is addressed, as well as to that of veterinarians of the country generally.

The important suggestions and conclusions of Dr. Schwartzkopff vary materially from those of the bill which we understand is to be laid before Congress at the recommendation of the United States Veterinary Medical Association. They read as follows:

Organization of a Separate Veterinary Medical Department, attached for administration to the Medical Department of the Army.

There should be three grades of Army Veterinary Surgeons. In view of the fact that these veterinary surgeons have to provide their own education, their ranks should consist of the following grades:

1st. First Lieutenant (mounted).

2d. Captain (mounted), after ten years' service, having passed an examination for promotion.

In each department one Veterinary Captain should be selected by the Secretary of War, as Inspector of Public Animals, and attached to the Department Staff.

3d. Major (mounted). One Chief of the Veterinary Department, attached to the Surgeon-General's office. This officer should be selected from the Army Veterinary Surgeons (or from civil life at the commencement) with the greatest care and with such qualifications as a distinguished professional repute and long experience, as he will be responsible for all the duties performed by the Veterinary Department. He will report to the Surgeon-General, Quartermaster-General or Adjutant-General of the Army, as the case may be.

The number of Army Veterinarians should be thirty, including all grades.

To all Boards convened for the purpose of purchasing and condemning public animals and for decisions as regards the hygienic care of public animals (examination of forage, etc.), a Veterinary Surgeon should be admitted as a member. * * * * *

United States Veterinary Sanitary Association.—The National Convention of the Consolidated Cattle and Horse Growers' Association of the United States is to meet on the 31st of October, in Kansas City. The United States Veterinary Sanitary Association will hold their annual meeting on the same day in the same city. Members of Veterinary Sanitary Commissions, members of Boards of Health and officers of Veterinary Colleges, and veterinarians in general, have been invited to attend. Much good may be accomplished by these gatherings, and we hope to be able to present our readers, in our next number, with an interesting report of the work that will have been performed.

The worthy Secretary, Dr. Paquin, will of course remember us in making up his record.

Extensive Outbreak of Glanders in Massachusetts.—An outbreak of this disease amongst the horses in Cambridge, Mass., is reported. A large horse establishment has had some 169 animals quarantined by the Cattle Commissioners, and the officers of the road are now fighting against this action, which was taken, we understand, at the suggestion of Dr. F. Winchester and Dr. Stockbridge, both members of the commission. Drs. Lyman, Harrison and Bryden have been called in, in the interest of the horse owners, to dispute the diagnosis of Dr. Winchester, and a difference of opinion has of course been the result; Dr. Bryden and his colleagues, if not altogether denying the existence of the disease, at least questioning the extent of its prevalence, and arguing against the propriety of withdrawing so large a number of horses from their work and consigning them to threatened and possible slaughter. The question is, of course, one of importance.

A suggestion has been made of obtaining expert opinions from veterinarians of New York and Philadelphia, in order to solve the matter satisfactorily.

It seems to us that much more is made of the whole subject than it deserves. While glanders is sometimes very difficult to diagnosticate in a *positive* manner, the fact that the disease exists in even the small number admitted by the dissenting veterinarians ought to be sufficient to justify the most positive and severe sanitary precautions, without reference to the amount of inconvenience it might devolve upon the owners of the road.

Prof. Law in Maryland.—Prof. Law, who has so handsome ly succeeded in stamping out plure-pneumonia in Cook Co., Ill., has been requested by the Department of Agriculture to transfer his operations to a new field, no less infected with the disease. He is now engaged in Maryland where we soon will hear of the good results of his energetic work.

ORIGINAL ARTICLES.

MALADIE DU COIT.

By J. D. Hopkins, D.V.S.

[Extract from his Report to the Stock Growers' Association.]

Cheyenne, Wyo., Sept. 12, 1887.

Hon. Thos. Moonlight, *Governor of Wyoming:*

Sir:—I received your telegram at Chadron, Nebraska, on the 18th of August, directing me to proceed to Illinois and investigate the reports of disease said to prevail among the horses near Bloomington, Illinois, and I herewith submit the following report for your consideration:

On arriving in Chicago I called on the Live Stock Commissioners of Illinois, who furnished me with a letter of introduction to Dr. Williams, of Bloomington, the veterinarian in charge of the infected animals in McLean and De Witt counties, also directing him to give me every facility in the examination of sick horses. This gentleman gave me much valuable information in regard to the spread of maladie du coit among the horses of De Witt County.

Dr. Williams has, by order of the Live Stock Commission, quarantined nearly 200 mares and nine stallions suffering with or exposed to the contagion. About forty mares and two stallions have died of the disease.

The mares are generally large draft animals of no pronounced breed, owned by farmers in bunches of from two to six head, and in addition to their usual farm work are expected to carry a foal each year; while the stallions are all thoroughbred Norman Percheron stock imported from France. These stallions are kept by the importers for sale, and advertised to stand for service during the breeding season at prominent towns.

This strange disease first attracted attention during the breeding season of 1885, and as the cool weather approached it seemed to die out. In 1886 it again appeared, and Mr. C. C. Culbertson, an importer of Percheron stallions, having some animals af-

fected with the disease, and many of his neighbors' mares becoming infected through his horses, and other stallions standing in the county, called a number of veterinarians to investigate.

This disease presented strange characteristics to the medical gentlemen called in, and it was only after considerable study into its peculiarities, and a large number of cases developing the same symptoms, that a diagnosis was made. Dr. Williams has demonstrated that the disease is maladie du coit, another of the plagues of Asia which has been known in the different countries of Europe for the past century, and is spread from one country to another through the importation of animals from infected localities.

It is a matter of fact, that many prominent veterinarians have repeatedly warned the people and legislators of the value and necessity of the enforcement of sanitary laws compelling inspection of all importations of horses from countries where maladie du coit prevails. Now this dread plague has gained a foothold among the horses of one of our best horse growing States, and the probability is that the disease will be widely spread.

I am informed by credible horsemen of De Witt County that previous to a knowledge of the character of the disease, stallions have been shipped to different parts of the country, and that since the peculiarities of the malady are known, information has been sent to such parties, so that the infection may be limited.

The origin of maladie du coit in Illinois is unknown ; it has existed so long that it is impossible to tell what importation brought it into the country. At present the disease is believed to be confined to Percheron stallions and the mares of De Witt County. Wide publicity has been given to the existence of maladie du coit in this country, and it is to be hoped, should any venereal disease develop among the breeding horses in any State, that the owners will at once quarantine the animals until an investigation by competent veterinarians.

Maladie du coit could only gain an entrance into the United States through the importation of an animal (stallion or mare) actually suffering with the disease, from an infected country

The Live Stock Commission of Illinois are making every effort to discover what animal introduced the disease. But the lapse of time since its introduction, the constant change in ownership of horses, and perhaps the interested motives of those engaged in horse traffic, renders it difficult to place the responsibility where it belongs.

There is a black Percheron stallion at Clinton, Ill., imported in 1882, and at present owned by Joseph Fisher. Last year this horse was suffering with maladie du coit, and was bought by his present owner for $300. Mr. Fisher has witnessed this disease in the "old country," and under his treatment the horse apparently convalesced, and this spring was advertised to stand for service, and was actually serving mares, although still suffering with the disease, when by order of the Live Stock Commission he was compelled to retire his horse into quarantine. This animal, when imported, was branded "D N" on the left side of the neck, and is believed by many to be the animal that brought the disease into this country.

It is not the custom in Illinois to brand their imported stallions, and we know that in Austria and Prussia (Fleming's Sanitary Science, vol. ii.) it is the custom to brand all stallions affected with maladie du coit, on the neck, so as to prevent their use as sires. If the Fisher stallion brought the disease from Europe in 1882, why is it that the disease received no attention until 1885 ?

A careful examination into the peculiarities of maladie du coit shows that a horse suffering with this disease may make an apparent recovery, and on returning to the stud have a recurrence of the malady brought on by excessive copulation. This may explain the lapse of time.

It is also claimed by some creditable horsemen of De Witt County, Ill, that the plague was brought from Texas. It appears that in 1885 a large number of mares were brought from Texas and stinted to the Percheron horses, and shortly afterwards the disease appeared among the stallions who served the mares. After much inquiring into this rumor, I am obliged to state that I don't believe it has any foundation in fact.

The first accounts we have in veterinary literature of maladie

du coit comes from Prussia in 1796, although it is believed to have existed in southern Russia before that period.

In 1815, Woltersdorf observed it in Austria, and Haveman, Director of the Veterinary School of Hanover, observed it there in 1816. From this time we have accounts of its spread over the different countries of Europe. In 1847 it was reported in Algeria, by the French veterinarian, Signol, and who described it as an "Epizootic Paraplegia." He also mentions that the Arabs had long been acquainted with it.

In 1851 the disease was imported into France, and spread to thirty-one communes around Tarbes. It reappeared in this district again in 1856, and Dr. Trelut traced the origin of the disease in Faance to the importation of a stallion from Syria, where the disease prevailed. No records appear of the existence of this disease in Great Britain, Spain, Denmark or Italy.

During the past century many eminent pathologists of Europe have devoted considerable time to a study of maladie du coit as it appears among the horses there, and they have demonstrated its contagious character and the manner of its spread. The French have named the disease "Maladie du Coit," the Arabs call it "El-Dourine."

This disease is peculiar to solipeds—equine and asine; it is contagious, and is transmitted in the act of copulation. The disease presents both local symptoms, affecting the generative organs, and those of a general character affecting more or less every organ of the body, producing a state of marasmus and great emaciation. It affects the nerves to a marked degree, ending in paralysis of the posterior extremities prior to death.

Some authorities have imagined it to be allied to human syphilis, basing their supposition on the course of the local symptoms, some of the pathological alterations and their serious character. Recent experiments by able investigators have failed to reproduce human syphilis by inoculation in the mare. Therefore all stories about the transmission of syphilis from man to the mare may be dismissed, as they have no foundation.

Although able pathologists in Europe have been for years engaged in the study of maladie du coit, it is to be regretted that

our knowledge of this disease is very limited; the primary cause or causes are as obscure as the peculiar form of the disease. Numberless hypothesis have been advanced by scientific men to account for the origin of maladie du coit, but as yet the problem is unsolved. Prof. Roll, observing that the malady is only witnessed among breeding animals, and is propagated by coition, states that it is not yet positively ascertained whether it is primarily developed in the mare or horse or in both, but that the latter is the most likely, and it is possible that an abuse of the genital functions of the male and the existence of a vaginal catarrh in the female are its occasional causes. It is true that in admitting this mode of production, we cannot explain the specific action of the secretion observed in this disease, and which, according to certain authors, ought to be considered as analagous to that produced in human syphilis.

Strauss attributed its evolution to the crossing of breeds, and the artificial manner in which horses and mares were reared.

Rodloff gives, as a general cause, an atmospherical epizootic constitution, which gradually modifies the animal economy until the evolution of disease is possible. He believed that a hereditary tendency, a catarrhal condition, cutaneous eruptions betraying a lymphatic dyscrasy, are all so many predisposing causes. The determining causes in the two sexes he imagined to be too frequent copulation, causing local superexcitation of the generative organs.

Lafosse, commenting on the influence of cross breeding, mixture of races, migration, change of climate and the mingling of eastern blood, concludes that all these, and particularly the latter, have changed the constitution of the horse, so far as its diseases are concerned, and have prepared it for the evolution of new and unknown maladies.

Daumas mentions that the Arabs believed that the female ass contracts the disease through an abominable offence committed upon it by the Arabs suffering from syphilis, and who fancy that this odious practice will cure them.

All these theories have been disproved by actual experience of breeders of all classes of domestic animals, and experiments of

able pathologists, and it leaves the origin of the disease involved in mystery. But we do know that if horses are imported from infected countries, sooner or later the disease will appear in healthy herds, where the malady was unknown until the introduction of diseased animals. Hence the great value and necessity of the enforcement of sanitary laws in countries where the disease is unknown, and permitting traffic with infected localities only under the most stringent rules and regulations, imposing a most rigid inspection by competent veterinarians.

Maladie du coit affects stallions and mares in two forms, viz., benignant and malignant.

In the mare the general symptoms in the benign form are often so trivial that they do not attract attention, usually appearing in from twenty-four hours to ten days after being put to the stallion. The animal is restless and stamps with the hind feet, whisks the tail from side to side, frequently stretches to micturate, but only voids a small quantity of urine at each attempt. It rubs the vulva with the root of the tail, and, if able to get near a wall, appears delighted to affriction this region against it; the clitoris is frequently erected, and there are all the signs of œstrum, so that the commencement of the disease is often mistaken for this condition; owing to its persistence, the mare is frequently sent to the stallion again. This unusual excitement of the genital organs should arouse suspicion, if the disease is known in the country.

The local symptoms consist, at first, in a heightened redness of the vaginal mucous membrane and tumefaction of the labia of the vulva, with the escape of a muco-purulent discharge therefrom. This discharge is at the beginning slight and serous, and merely renders the parts sticky; but it soon increases, becomes thick, viscid, and white, yellow or yellow-reddish in tint, concreting around the vaginal orifice, and soiling the perinæum and tail.

The mucous membrane of the vagina becomes of a deep or reddish-violet hue, and it and the vulva become the seat of œdematous infiltration, doughy and hard, which not only extends to the labia, but descends more or less in the perineal region. At this

time there appear on the mucous membrane of the vagina, vulva and clitoris, small miliary pustules, which soon become little superficial ulcers, no more than one-fifth of an inch in diameter. These ulcers are not long in cicatrizing, but they are replaced by others which, like the first crop, are more numerous in the fossa navicularis, on the clitoris, and near the margin of the vulva. These symptoms are intermittent, disappearing for some days and again manifesting themselves; in the majority of cases becoming milder, until they finally disappear.

In the malignant form in the mare we have the same symptoms as in the benign; uterine excitement, slight swelling of the lips of the vulva, redness of the mucous membrane, discharge, etc. After three or four weeks the symptoms become more accused; the tumefaction of the vulva increases and diminishes by turns; sometimes it remains limited to the labia and inferior commissure; at other times it descends in the perineal region to the mammæ; and at other times, again, it is nuelateral, and gives a deformed appearance to the vulva.

The mucous membrane is red and swollen, with more or less deep colored patches and conspicuous wrinkles, and the miliary pustules and cicatrices already described; while the temperature of the vagina is increased.

On the external surface of the labia, the perineum and the inner face of the thighs, there are often ecthymatous lenticular pustules, which are succeeded by small circular sores that readily heal.

There is vaginal catarrh, the matter being viscid, glutinous, dirty white in appearance, and frequently possessing a strong odor. This discharge is increased after *coitus*, during fits of coughing, exercise, and the emission of urine, which it either precedes, accompanies or follows. It adheres to the hair, soils the tail, perineum, inner surface of the thighs and hocks, and, in drying, forms yellow or brownish crusts.

At a later period it is endowed with irritating properties, due to the presence of a free acid, and causes depilation of the coat at those parts it comes in contact with; then it changes its character, becoming thick, purulent, of a yellow or reddish color, and gives off a strong, disagreeable smell.

The mucous membrane of the vagina and the vulva is also modified, and assumes a marbled appearance; the labia open, and the hypertrophied clitoris appears in the inferior commissure, all having a lardaceous consistency; while the vaginal orifice, deformed and gaping, resembles the anus of an old horse.

Mares that have conceived usually abort towards the third or fourth month of gestation; though this action does not stay the progress of the malady. Should the full term of pregnancy be reached, the foal produced is dwarfed, badly formed, and either dead at birth or dies soon afterwards. The exceptions to this rule are rare.

The emission of urine gives rise to pruritis, and occasions uterine excitement at the commencement of the malady; as the latter progresses the urine becomes thicker and viscid, and charged with salts, which are deposited on the labia of the vulva, in the navicular fossa, and on the clitoris.

These local symptoms are not present in every case with the same intensity, the individual differences being often very great; it sometimes even happens that they are scarcely noticeable. The general symptoms appear in the following sequence: Emaciation, lameness, nervous derangement, paralysis and marasmus.

If recovery takes place, it is only in those cases in which the disease is little developed; then the morbid phenomena diminish, the wasting stops, the vigor returns, and the other symptoms quite, or nearly disappear; though there often remain paralysis of the labia of the vulva, with hypertrophy of the vaginal mucous membrane.

The recovery, which is rare, may take place after seven, eight or ten months, or even longer. Lafosse, in his experiments, saw a case recover after nineteen months' continuance.

The duration of the malignant form is extremely variable. Death has occurred in five months, a year, and even two years; but frequently before this interval has elapsed the animals are killed, or intercurrent maladies hasten the disease to a fatal termination.

Inflammation of the mammæ is frequent, terminating in suppuration; also circumscribed inflammations of the skin. In weak

constitutioned animals there is often œdema of the abdomen, perineum and extremities. A floeculent discharge from the nostrils may also ensue, with tumefaction of the submaxillary glands, when the malady has continued for a considerable time; circular, flattened, but well defined swellings, one to two inches in diameter, may occur on the neck, shoulders, chest, abdomen or croup. These swellings persist for one or two weeks and gradually disappear, while others are developed elsewhere; their margin is the last to subside.

(*To be continued.*)

THE NATURE OF THE AMERICAN SWINE PLAGUE

IN REGARD TO ITS PREVENTIVE TREATMENT BY VETERINARY POLICE AND HYGIENIC METHODS.

By Frank S. Billings, D.V.M.

Director of the Experiment Station and Laboratory of the University of Nebraska for the Study of Contagious and Infectious Animal Diseases.

[Read before the Massachusetts Veterinary Association by its Secretary, Dr. L. H. Howard.]

(*Continued from page* 301)

With regard to the "wild-seuche" of Germany, to which I have referred in a previous paper, Hueppe seems to be in a quandary, and to be all mixed up with regard to what is contagious and what infectious. He says: "It is a fact that the exanthematous, or cutaneous form, occurs as a purely contagious disease, and is transmitted from animal to animal."

Hueppe seems to have forgotten the above, however, when a few lines further on he says: "The exanthematous form is by no means so frequent, under natural conditions, as the pectoral, and the pathological phenomena go to show that the disease should generally be designated as an 'infectious pneumonia.'

Those who have carefully read my paper upon the "Etiological Moment in American Swine Plague," must have become convinced of its very close resemblance to Hueppe's "wild-seuche." In fact, were we to assume that actual identity between two diseases, occurring in different localities, should be decided by the

morpho-biological peculiarities of the germs alone, under artificial conditions of development, or even by the microscopical lesions, one would be obliged to accept Hueppe's conclusion so far as the American swine plague and "wild-seuche" are concerned; but as I then demonstrated, this identity is absolutely contradicted by the clinical (or natural) disposition of the two diseases—the American being limited to swine, while the German attacks quite a number of species under natural conditions.

These diseases, like anthrax, black-leg, yellow fever, Texas fever, are primarily telluric diseases ("Bodenkraukheiten"); that is, diseases which have their primary origin in the earth; and again, no matter what effect they may have on animal life, it is the earth that becomes infected from such animals, and not other animals.

The idea that because such diseases can be, either accidentally or experimentally, transmitted to other animals, it constitutes them *contagious* diseases, is a patho-etiological absurdity, and the sooner we can drive this "miasmatic-contagious" humbug out of medical literature, the better it will be for our reputation as sane and logical thinkers.

Transmission by inoculation is simply a property that seems to be common to both contagious aud infectious diseases, constituting them both, in such cases, "wound-infection diseases."

Contagious and infectious diseases, again, have much in common, in that in either case, when of a constitutional character, the respiratory tract seems to be the chief seat of primary entrance to the organism. Inoculation per accidental wounds is rare in either case, and more rare in contagious than in infectious diseases. Like the animal parasites, however, some of these diseases seem to have a special predilection, or better pathological affinity, for certain organs.

Hueppe's assertion that the "wild-seuche" is a *contagious exanthema* (wound-infection disease), in one place, and that under the same circumstances (natural infection) it "should generally be designated as an infectious pneumonia," is only an example of the absurd carelessness and want of logical understanding that rules in the medical profession. To get out of this muddle, we

must stick to it, that a contagious disease is one which has its primary origin within or upon an animal organism, and never outside of it. The manner of transmission is a matter of no importance whatever in deciding this question, so far as it has reference to any form of inoculation.

Contagious diseases are transmitted from organism to organism, both by direct and indirect (cohabitation) contact.

Infectious diseases infect the animal organism by its being exposed to a common cause in the surroundings. They are never transmitted from a diseased to a healthy organism directly, or by cohabitation, except by the accidental presence of some intermediate conveyance.

The diseased organism simply plays the part of a local conveyance (or center) of infection, which offers favorable conditions for the transitory development of the inficiens, but in which it never develops primarily.

Had we telleological views of life, we might say that the micro-organismal enemies of life selected that life to be the means of spreading the means to its own destruction, but I don't believe any such nonsense.

In order to make my meaning still more evident, we will turn our attention to that decidedly infectious and manifestly non-contagious disease, Texas fever, the twin-sister to the yellow fever of our own species.

Like the swine plague, this is a local—or telluric—disease, capable of being temporarily transmitted to our northern pastures by Texan cattle, but, unlike swine plague, it seems incapable of withstanding our northern winters, and hence it soon dies out.

The Texas cattle seem to have become acclimated to it, but are none the less dangerous to our northern pastures, though scarcely any symptoms of illness may be seen in them.

I repeat, infected Texans are not, in or of themselves, at all dangerous to more northern cattle. The latter may breathe the same air with them, even lick them, in fact may be only separated from the Texans by a wire fence, and remain healthy; but if we remove the Texans and put the natives on the same

field the former have been upon, then the natives begin to die.

That is about all we know of the nature of Texas fever, except the singular assertion that the land-infecting power dies out in passing through the organism of but one generation of northern cattle; that is, the infection is not extended by them. That question wants better proof.

Let us consider anthrax for a moment, because it more closely resembles the swine plague, and is not so regardful of our northern fields and herds.

Anthrax is the most acutely malignant of all the known infectious diseases, but fortunately it is so decidedly a fixed disease —it requires such peculiar combinations in the climatic and telluric conditions—that there is very little danger of its ever acquiring any such devastating extension over a country as its less exacting relatives, in this regard: the swine plague, Asiatic cholera, etc.

Black-leg is another rather exacting member of this group, but its demands in this respect differ again from those of anthrax and the other infectious diseases. While it requires suitable extra-organismal conditions for its support and development, unlike the others, it is very exacting about the intra-organismal; it is an exclusive and aristocratic black-leg—it selects only the fattest and best of the herd, and also selects the young and tender, instead of the older members.

The peculiar danger possessed by anthrax is to be sought in the tenacity of life of its germ when in a spore condition. There is no known vital object which can exceed these things in their resistance to all sorts of changes of temperature and other conditions.

During my visit to Sioux City, Ia., in July, 1886, to investigate a so-called "unknown disease," which proved to be anthrax, I took pains to examine the fresh manure from a cow that had been exposed for about half an hour to the temperature of the air. The rods were developing the dangerous, permanent spores in the most beautiful manner and with wonderful rapidity. By adding the least amount of water to the manure and placing some under the microscope, one could see this process going on better

than I ever saw it in a fluid cultivation. I consider these manure deposits from anthrax-diseased cattle a more serious source of immediate danger to other cattle than the buried cadaver. Under such circumstances as the above—temperature 98 to 100° F.,—this spore development continues day and night until the action of the sun has so dried the mass that it has not moisture enough to favor the development further. During this time flies light upon it, and may then bite the cattle. They may tread in it with wounds in their skin, and finally—which is the most dangerous of all—the mass becomes broken up and is reduced to dust, and millions of death-dealing germs are spread about the field.

(*To be continued.*)

COMPARATIVE LESIONS OF BRAIN WOUNDS.

By Dr. G. Archie Stockwell, F.Z.S.

(Written especially for the American Veterinary Review.)

(*Continued from page* 307.)

Careful consideration of the *facts* in evidence reveals that surgery is constantly invoked for the evacuation of purulent matter in regions of the economy where the ratio of mortality is considerably greater than has ever occurred to brain wounds; therefore it behooves us to inquire what anatomical or physiological peculiarity pertains to the nervous system that it alone should be especially exempt! We are no longer bound by the superstition that the ventricles are the "apartments," and the sinuses the "emunctories of the soul;" nor does the *festiche,* in scientific circles at least, yet gain credence that the cerebrum is the seat of organism, and each of its fragmentary portions the definite derivative of a function. Note the history of cranial injuries and the strenuous efforts put forth by Nature towards their repair—efforts so frequently successful despite the adverse prognosis of science. Recall the experiments of Dalton, as found in his text book of "*Physiology*," and the demonstration that the brain was but a part of the universal organism; that the removal of lobes in their entirety does not necessarily result in cessation of Life; that al-

most an entire cerebrum or cerebellum, or a goodly portion of the medulla oblongata, may yet be sacrificed and again reproduced! With such evidences, derived from vivisections of lower vertebrates, does it not appear that, so far as the cranial cavity is concerned, we have been wilfully blind and disreputably negligent?

Again medical literature abounds with examples both among the higher and lower ranks of Mammalia, wherein the cranial vault has been fractured or fissured in all conceivable localities; its walls broken down, comminuted,and large portions removed; arteries ruptured, meninges torn, sinuses opened, ventricles entered, and entire lobes of the cerebrum destroyed: yet recovery followed and the victims were enabled to return to their former walks of life, none the worse for the experience save perhaps in the one item of suffering. A file of one journal for forty years exhibits no less than *twenty-seven recoveries* of this class, yet not in a single instance, as far as discoverable, were the lessons heeded, nor were the circumstances commented upon in any other way than "*Extraordinary!*"

In studying perforating injuries of the cranial vault, whether the result of accident or experiment, the almost axiom is evolved (paradoxical as it may seem) that the more extended and severe the injury, the greater the prospects for recovery; that when the cranial walls are crushed and comminuted, and the brain subjected to *extensive* lacerations—that when the force procuring the injury has been sharp, rapid and incisive—a liberal prognosis may safely obtain!

Why is this? Simply because in such instances the bone is not given opportunity to equalize the force of the blow and thus transmit the vibrations thereof to parts remote from the seat of injury! It is the reverse of this that procures concussion and contusion, and these two are the most fatal of all factors connected with cranial and intra-dural traumatisms. Deliberated, ponderous blows of trifling momentum invariably secure concussion and contusion; a sharp instrument forcibly applied will produce less comminution than its duller fellow; the sand bag or club is more dangerous than the sabre and the axe; and the stone more fatal than the bullet!

The larger the perforating injury then—*within limits*—the greater is the opportunity of exit for lacerated and mangled tissues, and the *less* the chance for compression; a fragment or mere specula of bone, undetected or overlooked, has brought more than a few unfortunates to the grave; and in the avoidance of compression is found the secret of the wonderful recuperative powers sometimes exhibited after the brain has been desperately wounded, with lacerations so extensive as to be positively appalling!

1. On September 13th, 1848, Dr. Harlow, of Cavendish, Vermont, was called to see Phineas P. Gage, who, while engaged in blasting upon a line of railway, had a tamping iron (a form of "crow-bar") *weighing thirteen and one-fourth pounds, and three feet seven inches long by one and one-fourth inches in diameter*, driven completely through his head. The pointed end entered just beneath the left zygoma, the entire instrument escaping through an opening *three and one-half inches in diameter* at the junction of the frontal and saggatal sutures. The frontal and both parietal bones were fractured, as was also the floor of the left orbit, and the temporal portion of the sphenoid;* besides the lateral sinus was opened, the optic nerve severed and the eye forced from its socket; and the left anterior cerebral lobe traversed and almost wholly destroyed, considerable quantities of lacerated brain escaping on various occasions. As may be imagined, the prognosis was "*Fatal.*"

Nevertheless the man made a speedy and excellent recovery, and as Prof. Bigelow, of Boston (who was associated with Dr. Harlow in the case) informs me, was given to vociferously cursing his attendants because they had not restored the sight of the injured optic. Twelve years later he was following the occupation of omnibus driver in Valparaiso, South America, and was there seen by Dr. Henry Trevitt. Dr. Bigelow also declares that Gage, at

* Further particulars may be had by consulting the *Boston Medical and Surgical Journal*, vol. xxxix., p. 389; vol. lxiii., p. 327; and vol. lxxx., p. 116. Gage's skull is now in the Museum of Harvard Medical School, having been obtained after his death in California in 1869. An account also appears in *Amer. Jour. Med. Sciences* for July, 1850: Bryant, Gross, and other authors give it mention.

no time subsequent to the injury gave evidence of mental impairment. *During a lapse of nearly forty years this lesson has passed almost unheeded, save as a curiosity.*

The two following cases occurred in the practice of the father and uncle of the writer, and were matters of individual observation as a student; they are reproduced from notes that, along with the *breech-pin* in question, came into my hands on the death of the second physician, named Dr. Geo. B. Willson.

2. "June 4th, 1859. Dr. S. and myself were summoned to see S. W. B. a cabinet maker, age 22, wounded in the head by a circular saw. Found him at the shop were the accident occurred, and sitting on a chest unsupported and unaided, and perfectly rational. He volunteered the information that after adjusting a belt beneath the table, in the act of returning he brought his head in violent contact with the rapidly moving saw—a disk sixteen inches in diameter, one-fourth inch in set of teeth, revolving at the rate of 3,800 per minute. It was an affair of a second only; the impulse of the disk felled him to the floor, but he immediately recovered, backed out, rose, seated himself on the chest where we found him, and summoning a fellow workman dispatched him for surgical aid.

"Fifteen minutes may have elapsed between the receipt of the injury and our arrival. There had been considerable bleeding, judging from the clots of blood on his neck and the stains upon his clothing and the floor; but this had been controlled by a workman's apron tightly wrapped about the head. He denied any sense of pain save at the moment of coughing, which just began as he raised himself from the floor, and now was most persistent, dry and hacking.

On removing the cloth from his head a wound seven inches in length, above three inches in depth and corresponding to the "set" of the saw, was revealed, extending immediately across the sagetal suture and dividing the longitudinal sinus, falx and branches of the middle meningeal artery; beginning at the superior temporal ridge of the left parietal, it terminated on a level with the tip of the right ear. While coughing, each inspiration caused the brain to shrink from the skull, admitting air beneath the dura

that, with the expulsive effort, was mingled with blood and hurled to a distance of a yard or more.

"While cleansing the wound exteriorly, the cough ceased, but whether a spontaneous result or the effect of a quarter grain of morphia acetate administered dry upon the tongue a few moments before, I am not prepared to say. With a pocket-case grooved director the bone dust was removed from the interior of the wound as far as possible, by scraping both the brain walls and the bottom of the cavity; an abundance of crumbs buried in cerebral tissue were thus removed. Next the wound was closed save at its most dependent extremity, by laying within a folded and oiled piece of chamois skin; the whole afterwards covered with adhesive strips; when the patient was conveyed to his home in a carriage and placed in bed in a cool room."

To avoid prolixity I will merely add that the head was dressed at intervals of one to four days, as required, during a period of six weeks, and soon after the man resumed work in the shop. At no time did he suffer any pain, and the sum total of medication, aside from the morphia above noted, was a *half seidlitz powder*. Shock was appreciably less than where muscular tissues are involved, and this I have observed to be true generally of all open and fully incised brain wounds. Two years after the accident the man removed to Canada and all trace of him was lost, though I was recently informed that he yet lived, preserved excellent health and in full possession of all his senses and faculties.*

*In the *North American Medico-Chirurgical Review* for January, 1858, I find an almost parallel case reported by Dr. Ellerslie Wallace of Philadelphia. The wound, inflicted by a circular saw, was four and a half inches in length by one-fourth in width, and extended horizontally across the skull along the coronal suture, lacerating the brain and dividing the longitudinal sinus. The patient, a girl ten years of age or thereabout, recovered without a single untoward symptom.

(*To be continued.*)

Maladie du Coit.—It is stated that the number of mares and stallions now in quarantine in this State on account of the disease known as *maladie du coit*, is over 200.

HOG CHOLERA AND SWINE PLAGUE—THEIR NATURE AND PREVENTION.*

By D. E. Salmon.

Investigation of several years led me to conclude that a micrococcus or spherical microbe was constantly found in hog cholera. In 1886, contrary to the above, I stated that hog cholera was caused by a bacterium or short rod-shaped germ very distinct from the above micrococcus. This bacterium produces this disease even when cultures are fed to healthy swine. In connection with this germ a micrococcus resembling the fowl cholera germ was occasionally met with, which produced fatal effects when cultivated and inoculated upon mice, rabbits, guinea-pigs, pigeons, fowls and swine.

In cases where the micrococcus was not accompanied with hog cholera bacterium, the lesions were distinct and easily distinguished from this disease. The lungs were sometimes more or less adherent to the thoracic walls, were hepatized, friable, the alveoli were distended with a whitish cellular exudate, and there were occasionally patches of necrosed tissue. The liver was often in cirrhosis condition, leading to jaundice. In hog cholera the lung lesions are very different, and usually are absent, but when present generally consist of an extravasation of blood into the tissues and alveoli of one or more lobules, but hepatization is very rare, and a secondary result seems to follow the hemorrhage. Hog cholera is noticeable from numerous ulcers and enormous ulcerated patches in the large intestines.

Though the lesions are very different in these two maladies, the reason that this has not been noted before is probably owing to the complicated affection, the two diseases frequently existing at the same time in the animal. The complicated trouble has been considered the typical hog cholera, while each malady existing alone has been regarded as a variation from the typical form. The contagious pneumonia in the future I shall call swine-plague; the other disease hog cholera.

*Abstract from paper read before the Soc. for the Promotion of Ag. Science Aug. 9, 1887.

The hog cholera microbe is short and rod-shaped; in the tissues it stains almost uniformly around the periphery, and shows an unstained central portion. The swine-plague microbe is a shorter oval, and stains at the ends with an unstained band across the central portion. The former is very motile in liquid cultures, while the later has no independent motion whatever. Hog cholera germs grow actively on the cut surface of potatoes, producing a colony of a brownish color; the swine-plague germ does not grow at all upon potato. The former retains its vitality for from thirty to sixty days after being thoroughly dried; the latter perishes under similar conditions within about three days. Hog cholera germ is capable of active multiplication in drinking water, and retains its vitality in such for at least four months; swine plague germ is unable to multiply in water and the added germs die within ten days. Cultivated germs of the latter administered hypodermically in large quantity kill pigeons and pigs, while hog cholera germs occur abundantly in the internal organs in either. We have never killed fowls by inoculation with hog cholera germs, but large doses of swine-plague produce fatal results. A very intense and fatal form of hog cholera is produced by feeding cultures of the microbe to pigs which have been without food for twenty-four hours, but cultures of the swine-plague germ fed under identical conditions produce no effect whatever.

It has been demonstrated satisfactorily that hog cholera germ is able to and does habitually reproduce and preserve itself indefinitely in moist soil, manure, stagnant water and even in a good quality of drinking water, and these are probably largely the means of its dissemination. In the pig's stomach taken from these sources it produces a fatal form of disease. In view of these facts experiments were undertaken to discover a means of disinfection to be applied to soils, etc., without danger of injuring the animals. Interesting results were secured from using lime, that may be summarized as follows:

The cultivated germ placed in water to which was added one-third its volume of lime water, was killed in one-half hour. If one sixth of the volume of lime-water was added the germ died within three hours. If lime-water contains 0.12 per cent. of lime,

then 0.03 per cent. in solution destroys the germ in one-half hour, and 0.019 per cent. destroys it in three hours.

As the quantity of disinfectant required must be increased with the proportion of organic matter present in the substance to be disinfected, it was desirable to test the effect of lime in the presence of large quantities of organic matter. Replacing pure water with beef infusion it was found that, in order to destroy germs placed in this it was necessary to add one and one-half its volume of lime water, and then some were alive at the end of four hours, but all were dead within twenty-seven hours. With twice its volume of lime-water the germs were all destroyed within four hours. That is .072 per cent. of lime killed the germ in twenty-seven hours, and 0.08 per cent. in four hours; and it required from two and one-half to four times as much lime in solution to destroy the germ in beef broth as in pure water.

These results caused us to test the power of lime to destroy the germs in mixtures containing relatively large quantities of organic matter. This mixture was made by soaking chopped beef over night in twice its weight of water, removing the liquid with a press, neutralizing, adding the white of one egg to each 600 c.c. of liquid and boiling. The flasks containing the mixture showed a layer of solid particles on the bottom nearly as deep as the liquid above it. These flasks were sterilized, inoculated with the microbe of hog cholera, and at the end of three days when each drop contained nearly a million germs, milk of lime containing 10 per cent. of lime, was added in various proportions and the vitality of the germ was tested after the lapse of a certain number of hours. Five cubic centimetres of milk of lime in 150 c.c. of the beef mixture destroyed all the germs within one-half hour; equivalent to 0.32 per cent. of lime.

The result of an experiment to determine the effect of powdered lime upon the germs in a mixture similar to the above last noted, demonstrated that one per cent. of lime killed all of the microbes in one hour, and that one-fourth of one per cent. killed them all in four hours.

If a cubic foot of soil weighs 80 lbs. and a bushel of lime 80 lbs., then 55 bushels of lime thoroughly incorporated with the soil

on an acre of ground to the depth of six inches would not only be sufficient to prevent the growth of this germ, but would destroy it after it had gained a lodgment. The various measures of disinfection must for a long time be our chief reliance in combating this disease.

AMERICAN VETERINARY COLLEGE.

HOSPITAL DEPARTMENT.

THE PROPER PLACE FOR HYPODERMIC INJECTION.

By Dr. J. Huelsen, Jr., House Surgeon.

In the use of the hypodermic syringe, besides the ordinary care as to cleanliness, condition of solution, etc., the situation of injections oftentimes should also receive attention, as the following case will illustrate. A bay gelding, 16 hands, 9 years, exhibited symptoms of spasmodic colic early on the morning of Oct. 5th. A practitioner was hurriedly called, who used a solution of morphine, selecting the right side of the neck, lower portion, as the point of hypodermic injection. In the afternoon slight colicky pains still continuing, the patient was brought to the hospital, and with exhibition of antispasmodics internally, toward evening all pains subsided. A slight constipation remained as sequel which, however, soon disappeared. The next day, the 7th, the patient was considered ready for work, with the owner anxious to use him; but on examining the neck, a soft tumor was discovered where the syringe had been used—an abscess had developed—and this was opened on the 8th of October, with quite a discharge of pus. Up to date (Oct. 20th) the parts are not yet healed, the discharge, although much less, still continuing; and from the situation of the wound, interfering with the use of the animal for this length of time.

It will be seen, therefore, in cases of spasmodic colic, which are likely to be of short duration, as a precaution against similar results, that the abdominal region would be a good place to inject. This would be preferable, not only as being nearer the point of pain, but also in case of complication, obviating vexatious delay, as in the case cited.

MELANOTIC TUMOR OF THE TAIL IN A BAY HORSE.

By the Same.

A bay gelding, 15-1 hands, and about 17 years of age, was brought to the free clinic on Sept. 26th, for treatment of a "lump on the tail." This, the owner stated, had twice been removed; once by excision with the knife, and again by caustics, and each time had again appeared. On examination it was found to be one of the rare case of melanosis in a *bay* horse, being situated laterally near the base of the tail, somewhat round, about two and one-half inches in diameter and without pedicle. None others could be found externally on any other portion of the body. At the owner's desire, it was determined to remove the tumor, but without much hope of permanent eradication. An elastic ligature was applied at its base, which, at the end of a few days, had cut through, leaving a wound about two inches in diameter. This was cauterized with nitrate of silver and simple dressing applied. At the next clinic day a small portion of sloughing tissue was removed from the wound, leaving a healthy granulating surface. The animal has attended every clinic day since then, the granulations being controlled by nitrate of silver and dressed with oakum, saturated with carbolic solution and bandage. At the present time a small, healthy granualting surface remains, and contrary to expectation, there is every indication of a permanent disappearance of the trouble.

In the removal of similar small tumors, such as epithelioma, or extra scrotal champignon, we can commend the use of the elastic ligature, which often seems to have a marked result in its deep action, and where possible, permanent relief often obtained.

The principal interest in this case is the fact of the presence of this kind of tumor (melanotic) in a bay horse, where they are not commonly found.

ENTROPION IN A DOG.

By the Same.

An English mastiff suffering with this trouble was brought to the hospital on Oct. 4th, for treatment. About one-third of each

eyelid, towards the inner canthus, was inverted on the eyeball, and the constant irritation had induced a chronic conjunctivitis, this condition having now existed for about five weeks. An operation being necessary, Dr. Pomeroy kindly tendered his services. The operation was a simple one, the animal being placed under the influence of ether, on Oct. 8th, and the diseased border of each lid trimmed off with a small pair of curved scissors, so as to allow the lids to adapt themselves naturally together. The portion removed on each was nearly one-half inch long and about one-fourth inch wide. Since then the wound is healing favorably; the treatment being simply to keep clean and the animal is apparently relieved of all cause of trouble.

RUPTURE OF PERINEUM IN A MARE.

By Dr. W. Curry, House Surgeon.

I have never yet seen in print a record of a case of this kind and from good authority learn that there are none recorded, probably due to the fact of uniformly bad, or unfavorable results.

Were the lacerations confined to the perineum proper I see no reasons why they should not heal rapidly enough, but such cases are exceedingly rare. Rupture of the perineum must necessarily mean more or less extensive lacerations of roof of vagina and floor of rectum. Now no matter how closely or how well the torn edges of rectum are adapted to each other, where the fœces collect there—and they have more opportunity to collect on account of lost expelling power of this portion of the rectum—away go your sutures; and should they fortunately hold for a time—the process of healing is so much interfered with by the collection of fœces, that the sutures become macerated, partly absorbed, and finally give way entirely before the edges have had time to unite. This difficulty might be overcome by using silver wire, but this must be so fine in order to introduce at all that it readily cuts through the edges.

The subject of which I write, was a brown mare, ten years of age, fifteen hands two inches high, and was admitted to the hospital on Saturday Sept. 24th, 1887; the following is the history: Sept. 16th,

during the act of parturition, one fore-foot of fœtus caught in the floor of vagina—the leg flexed sufficiently to allow the other fore-foot and head to protrude from the vulva. The attendant (a layman) seeing that the mare could not further deliver herself, went to her assistance, and by combined efforts of man and mare, paturition was completed and perineum ruptured. A veterinarian was immediately called, who united the torn edges of perineum with cat-gut sutures, which tore out in course of three or four days, and on date above mentioned mare and colt were sent to the hospital. On examination next morning found rupture not only of perineum proper, but of floor of rectum, roof of vagina and intermediate cellular tissue, extending nearly to cervix. The torn edges had retracted to either side and the cellular was much infililated and swollen, so that on each side of cavity—between edges of rectum and vagina—there was an extensive granulating surface, about eight inches long by two inches in width at anterior border, and external or posterior border (which presented space from anus to superior commissure of vulva), of about three inches. An operation was performed more to satisfy the owner than anything else, in the following manner: The cavity was dilated by assistants, with large flat-bladed tenaculums, sufficiently for the operator to introduce his hand and pass suture through floor of uninjured rectum. One end of this suture was then passed through torn edge of rectum, on one side, about two inches posterior to uninjured portion, and the other end through opposite edge at point corresponding to first; before securing this another suture was passed on each side through the edges of rectum at or near first and also through the edges of vagina directly underneath; both sutures were then drawn tight and secured. By this means the uninjured portion of rectum was drawn posteriorly about ten inches and secured. Three more interrupted sutures were placed in the roof of vagina and one in rectum near anus and three in perineum. The mare and colt were put in a large box stall and fed on milk, oatmeal and bran during the day.

Sept. 27th.—This morning found sutures, excepting first two all, given way—untied—and the parts much more swollen. Decided to make one more attempt, so the stitches were renewed and se-

cured by three or four knots each. During the night she had passed but little fœces and these were quite hard. To avoid as much as possible, the fœces collecting in rectum, gave frequent injections of warm suds. Fed same as yesterday.

Sept. 28th.—Sutures remain intact. Passed some fœces—a little softened—during the night, but nothing more during the day. Appetite good and temperature, pulse, and respiration, normal. Continued injections and same food.

Sept. 29th.—Found this morning that the fœces were collecting in rectum and being forced through into vagina. As the edges could not possibly unite under such circumstances, the sutures were all removed and we found, after their removal, that not the slighest adhesion had taken place. After this the parts were simply kept clean and on October 5th, when the mare went home, the mucous membrane of rectum and vagina had very nearly united, a very narrow granulating surface remaining—thus making one large common opening.

REPORTS OF CASES.

AN EXTENSIVE OUTBREAK OF ANTHRAX WITH GREAT VARIATION OF SYMPTOMS AND THE REMARKABLE EFFECTS OF POTASH, CHLORATE AND ACID CARBOLIC AS A PREVENTIVE AND CURATIVE AGENT.

By J. Dutoliffe, V.S. of Middletown, N. Y.

During the past two months my attention has been called to the outbreak of splenic apoplexy among eight herd of milch cows—a total of 167 cows—also a number of calves and one horse, causing a loss of twenty-one cows, four bulls, two calves and one horse. The first notice I had of it was early in August on a farm owned by Mr. Walling, near Hampton, owner of sixty cows. A self-styled veterinary surgeon had been called in on the day the first cow showed symptoms (three days previous to my being called). Diagnosis: Hollow horn and nails in stomach. Up to the time of my arrival (about 9 P. M. Aug. 10) seven cows had died. I examined five cows, which were in a stable, suffering from the disease. Diagnosis: Splenic apoplexy. I ordered the

remainder of the milch cows, thirty-two in number, brought to the barn for examination. Sixteen dry cows that had not been in contact with these cows, and pastured about one-eighth of a mile distance, were not examined until morning. On examining the thirty-two cows, only one had a temperature below 102; temperature ranged from 102 to 108. The following table will show the temperature of the worst cases with the great variation of temperature during twenty-four hours:

Aug.	10	11		12			13		14		15		16	
Case.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	
1	5	4	99⅔	2½	1	1								
2	5	5	105	2	1½	1								
3	6	5½	2½	100	99	100								
4	5½	4	97	1½	99	98								
5	7	6	2½	1½	1	98								
6	4	4	3	4	2	1								
7	4	3½	98½	2	4	7	8	8	6	4	2	2	1	
8	8	6	4	4	3	2								
9	4	4	2	1½	100	99								
10	5½	Dead,												
11	6													
12	7	6	1½	2½	2	1								

In the above it will be seen I have generally put down the fraction only, ommiting the 100.

Symptoms in both the cases where the temperature was 108° were, loss of appetite, inclined to lie down, difficult breathing, back-ache and tenderness over loins.

In some of the other cases there was diarrhœa with large quantities of blood; areolar tissue of the back and sides crepitous to the touch had the appearance of being inflated with air; urinary organs and nervous system appeared normal in this herd.

Secretion of milk diminished.

Treatment ℞ Pot. Chl. ʒ iv.
Acid. Cab. M. xx.
Aqua. ℥ viii.

to the worst cases three times a day. Mild cases and all exposed cattle twice a day for ten days.

Two or three that were inclined to lie down received whiskey twice a day. For diarrhœa one quart of starch gruel twice or three times a day, according to severity of symptoms, with plumbi acet. ʒj twice daily where there was any blood with the fœces.

The stables were frequently fumigated with sulphur and charcoal burnt in pans.

Prognosis of five cases fatal; on the others guarded.

After examining and making notes, administering medicine etc., I left at 3 P. M., returning at 7 A. M. Aug. 11; case No. 10 and 11 dead.

Held post-mortem.

From this date on they all improved. Aug. 20th, all discharged.

The dry cows were examined on the 11th, all well.

Aug. 30th, I was called again. One of the dry cows that appeared well in the forenoon, was found dead about 6 P. M. On examination five of these were sick; all received the pot. chl. and acid. carb., including those that did not show symptoms. All recovered. Recommended horses to have the same treatment.

Sept. 2d, called at 6 A. M. to see a two year old colt, supposed to have distemper (strangles) having begun to swell in sub-maxillary space on the evening previous. When I arrived at 10 A. M. found colt was dead.

This colthad run with the dry cows until the 30th inst. Only one dose of medicine had been given to the colt. No animal died on this farm after receiving two doses of medicine.

There are four or five farms adjoining this one, on two of which the cattle were put under a course of treatment. None of the cows on these two farms showed any symptoms. On one of the other farms, three cows died; the remainder were then put under treatment, one of which had a temperature of 107°, all recovered. The next place it made its appearance was about one mile from the first farm; two cows and one bull died suddenly; twenty-seven were put under treatment and all recovered.

Another adjoining farmer lost two.

The other outbreaks were as follows:

Seven miles from the above place, one cow dead and one sick on my arrival. Put eight cows under treatment and all survived. My next call was in Sullivan Co., town of Liberty, where I found three dead steers, two yearlings, one two year old, another two year old sick, also five heifers from two to four years old. Same treatment and all recovered.

Another case of importance came to my attention Aug. 22d. Messrs. Bartholof and Crawford, two well to do farmers and owners of large dairies, Mr. B. owning about 150 cows and Mr. C. forty-five, went to Buffalo stock yards and purchased forty-four cows, new milkers and springers. On their arrival here one of the cows could not be made to rise in the car and was taken home in a wagon; the following day it died. The cows were divided, each taking half. Three days later Mr. C. lost one suddenly, supposed by him to have died from impaction of stomach. Another cow died suddenly three days later. The next day I was called to hold the post-mortem. On examining the other cows, I found two that were passing a large amount of bloody urine, urinating frequently, stiff gait and not inclined to move, and the remainder of the new cows all showing symptoms of splenic apoplexy, resembling those on the farm of Mr. Walling, with the exception that there were no passages of blood per rectum, or diarrhœa in any of these cases, but large amounts of bloody urine, which symptons were absent in all of the other cases except those of Mr. Bartholof which were shipped with these cows. Mr. C. informed me that the last cow that died passed a large amount of bloody urine, so I directed my attention to examining the kidneys, which I found almost as black as melanosis, very much enlarged and easily broken down between the fingers. These cows were all noticed to urinate frequently and in large quantities. Treatment the same, pot. chl. and acid carb. The kidney complication was a new one to me, and I was at a loss to know what to prescribe in addition to the above, as the pulse was very weak. I did not think I would get any benefit from aconite, I was afraid of cathartics setting up internal complications; therefore I resorted to perchloride of iron and linseed gruel. These two cows both died. I held post-mortem immediately after death: the kidneys were about the same as in the aforementioned one.

A calf from one of these cows, which survived, was taken away from its mother as soon as dropped, and fed on the milk from some of the old stock cows. Three days after it had a temperature of 106°. I killed this calf and found spots of ecchymosis on the spleen, it being also congested and broken down at lower extremity.

The new cows were allowed to run with the old ones one week before I was called, and none of them showed symptoms of the disease, but were all put under treatment; the only animals that died after my arrival were the two above mentioned.

On the farm of Mr. B. the cows appeared about the same, with the exception of his having a number of calves from two or three days to thirty days old, which all showed symptoms of the disease; one that died, that was about four weeks old, on post-mortem examination revealed enlargement of the spleen to fully three times that of a full grown cow; it was as large as any that I found in the cows. Mr. B. also lost two cows with symptoms the same as those of Mr. C., making a total of seven cows and one calf that died out of the forty-four.

It will be seen by the above that no animal died after receiving two doses of the medicine, except the four that died with the kidney complication; also that no animal that had received it as a preventive showed any symptoms of it.

The question arose in my mind, What caused the kidney complication with absence of bowel complication, among the one drove while in all the others it was visa versa. I thought that it might have possibly been due to the difference in the food, but I was unable to find out on what kind of food these forty-four cattle had been fed previous to being shipped.

Can any of the readers of the REVIEW throw any light on this subject? If so I would be pleased to hear from them.

Another peculiarity in these cases is the sudden fall of the temperature.

EXTRACTS FROM FOREIGN JOURNALS.

SPLENIC HYPERTROPHY.

BY MESSRS. BOWRET AND DRUILLE.

A strong, vigorous horse, aged 13 years, which had never been sick before, was found one morning, by the man who had the care of him, dull and anxious-looking, and manifesting some slight colic. An hour later he fell down heavily, and it was only with the greatest difficulty that he was placed on his feet again. His walking then became difficult, the anterior legs moving quite

regularly, but the hinder, especially the right, seeming paralyzed. Venesection, practiced at the jugular, brought at first a flow of very dark blood, which escaped slowly, and soon ceased spontaneously, almost completely. Opening the caudal or saphena blood-vessels gave no better result. Lying down, the animal struggled, without great force; the skin was covered with cold sweat; the mucous membranes were highly congested, and of a dark wine color; the pulse scarcely perceptible; the artery small and soft; respiration deep and accelerating; temperature, 36° C.; paralysis rapidly progressing. Death occurred in the evening, about ten hours after the appearance of the first symptoms, notwithstanding the attempt at treatment, which consisted of strong dry frictions, with irritating and blistering applications, and injections of bromide of potassium, increased from one drachm to one ounce every two hours.

At the post-mortem the organs of the thoracic cavity were comparatively normal, but on opening the abdominal cavity a large bluish mass made its appearance. It was the spleen, in form about the same as in the normal state. The posterior border was thickened; the anterior presented a deep groove, where the blood-vessels and nerves are lodged, and the point was considerably thickened. The whole organ weighed *forty-two pounds.* Cutting in various directions revealed no trace of inflammation; there was no abscess, no cysts, no parasites. All the other organs were healthy.

The author asks if this hypertrophy took place suddenly, when the animal presented the first symptoms, or if it was the effect of a gradual change. He inclines to the latter, because of the abnormal density of the tissue and its resistance to the edge of sharp instruments.—*Recueil de Med. Vet.*

SALIVARY FISTULA OF WARTHON'S DUCT IN THE DOG.

By M. Brissot.

For three or four days the under-jaw of the dog was continually moist, though notwithstanding the pain and the annoyance produced by the disease, he continued to eat well. Though the region had been well oiled, the hairs were sticky with the discharge. At first the animal seemed to be suffering with a local

eczema, but when the skin was cleaned and the hair cut off, a different diagnosis was easily made.

At the inferior border of the parotid region a small opening appeared, from which, drop by drop, a transparent, somewhat sticky fluid was escaping; it was the saliva. The case was one of the salivary fistula of Warthon.

Having previously obtained good results from the use of pure liquid phenic acid in the treatment of synovial fistula, the author decided to employ the same treatment in this case, and with a directory introduced a few drops of the acid through the open mouth of the canal. The result was very satisfactory, the flow having stopped on the day following, by an œdematous swelling around the opening. The appetite of the animal did not seem to have been interfered with. Three days later the dog was entirely cured.—*Recueil de Med. Vet.*

A CASE OF URETHRAL FISTULA IN THE DOG, AFTER THE AMPUTATION OF THE PENIS.

By M. Moussu.

Excited by the presenceo f a bitch in heat, a dog, heating, copulated with her and becoming *attached* to her in the usual way, the owner of the female, maddened by the act of the dog, separated them by a blow of a scythe. The punishment of this amatory transgression was terrible for the poor dog. Bleeding profusely and suffering excessively, he ran to his home, and Mr. Moussu was immediately called. When he arrived the dog was much weakened and prostrated, and death by hæmorrhage seemed rapidly approaching. No indication presenting itself except that of stopping the hæmorrhage, this was done, and the animal made a comparatively good recovery, as he lived some five years longer.

When the post-mortem was made, no external appearances revealed the mutilation he had suffered; but a complete dissection showed that the penis represented only a stump, about two centimetres in length, rounded at its end and without any urethral opening; but the perineal region, a little above the ischiatic arch, showed a urethral fistula, entirely concealed by the hair.

At first, while the animal was still suffering, he had submitted to treatment, but after a few days, when he began to improve, he

rebelled against the introduction of a probe that would keep the urethra open. The result was that it soon closed, and urethrotomy had to be performed, and as the skin and urethral mucous membrane soon became united together, the function of micturation was performed with comparative ease.—*Recueil de Med. Vet.*

THREE CASES OF FATAL PLEURISY OF AN APPARENTLY CONTAGIOUS NATURE.

By Mr. E. Humbert.

First Case.—A mare, "Helepole," 8 years old, suffered a sprain of the fetlock, for which she was fired with fine and penetrating points.

Three days later she became sick and refused her food. Her respiration was accelerated, extremities cold, nostrils dilated, and her temperature reached 40.5° C. The next day the symptoms were more marked, and there was evidence, well developed, of an attack of acute pleurisy. Among the symptoms present, a somewhat abundant nasal hæmorrhage showed itself at the beginning, and lasted forty-eight hours. She died on the fifth day.

At the post-mortem the chest contained ten quarts of reddish fluid, and a large quantity of false membranes.

Second Case.—Three months later, another mare, 10 years old, received a kick on the left fore-arm, and was placed for treatment in the same stall in which the first mare had died. Having recovered from her injury, she was about to be discharged, when, ten days later, she suddenly refused her food. She had chills, her body became cold, her ears were covered with a cold sweat, the respiration was accelerated, and her temperature rose to 40.6° C.

The next day the respiration had still risen and had become abdominal, the nostrils were covered with a flow of blood, and auscultation, percussion and every other sign proved her ailment to be pleurisy. She died the fifteenth day after the attack.

The autopsy confirmed the diagnosis.

Third Case.—A horse, "Empereur," 9 years old, was fired on the off fore-leg and placed in the same stall which had been occupied by the two preceding. The next day he presented the same symptoms which had appeared in the second case, and not-

withstanding a course of severe treatment, died on the sixth day afterwards.

Post-mortem inspection revealed the same troubles. From that day the stall was thoroughly disinfected, and since then no more cases have occurred amongst the animals that have occupied it.

In the presence of the idea of the contagious nature of pneumonia, do not these three cases suggest the reasonableness of a similar condition existing in respect to pleurisy?—*Recueil de Med. Vet.*

REVIEWS AND NOTICES.

PHYSICIANS' VISITING LIST.

The "custom of the season" with publishing houses of issuing "Physicians' Visiting Lists" has brought to us one which we might correctly call an old friend, having used it for many years. It is that published by P. Blakiston, Son & Co., of Philadelphia. We have found it "very handy to have," and especially as the more complicated work of book-keeping can be dispensed with to a great extent by its use. On that account we can fully recommend it to veterinarians.

Another style, new to us, published by G. S. Davis, of Detroit, Michigan, is offered to us by our friend and correspondent, Dr. G. A. Stockwell, of Port Huron. It is brought out in very good form, and the numerous subjects which it comprises must render it a decidedly useful companion and aid to the busy practitioner.

DISEASES OF THE OX. By J. H. Steel, M.R.C.V.S. Second Edition. Longman, Green & Co., London.

Only five years ago Professor J. H. Steel issued the first edition of his "Diseases of the Ox," and yet to-day the second edition, with much new matter added, is offered to the veterinary student and practitioner.

The time is gone by when the subject of bovine pathology could be ignored in veterinary literature, though we may yet remember the good works of Youatt, Clater and others. They have done good service, but are no longer capable of supplying

the needs of the student of to-day in that specialty. The progress which has been accomplished in this particular department of practice has left them far in arrears of present requirements. The student will therefore warmly welcome the new and enlarged edition of "Diseases of the Ox."

In this new work Professor Steel discusses, in eleven chapters and three appendices, all the diseases to which the large ruminants are liable, and every chapter is prepared equally in the clear and lucid literary style characteristic of the author. But among them all, the second chapter, with its two sections, has proved to us the most interesting. Treating of diseases of the blood, it comprehends all the contagious diseases of cattle, with their mode of treatment and of prophylaxy, treating incidentally the various subjects of vaccination and inoculation, in the consideration of which the labors and experiments of Willems, Pasteur, Cornevin, Arloing and others, are made familiar to the reader.

"Diseases of the Ox" forms a handsome volume of over 500 well-printed pages. It is illustrated by over 100 good wood-cuts, and contains at the end a bibliography of cattle pathology in the English language, which shows on the part of the author a most thorough acquaintance with the literature of the subject.

Prof. J. H. Steel is already well known for the numerous writings for which English speaking people have become his debtors, and now, with this new edition of "Diseases of the Ox," he has filled, for many years to come, a want which everyone must have felt when a desire or need of information or research has occurred in general practice.

VETERINARY APPOINTMENTS.

Dr. S. K. Johnston, D.V.S., has been appointed Veterinary Surgeon to the Board of Health of the city of New York, after a successful examination according to the requirements of the Civil Service law.

Dr. W. Lowe, D.V.S., already State Veterinary Inspector for the State of New Jersey, has been recently appointed Superintendent of the United States Cattle Quarantine at Garfield.

OBITUARY.

Etienne Desire Edouard Chambon, graduated at Alfort, died recently in Jersey City, where he had been practicing for a number of years.

Born in France, Dr. Chambon entered the School of Alfort in 1865, and during his studies received a first prize at the end of each year. He graduated in 1869, and after remaining a few years in Paris, removed to America.

CORRESPONDENCE.

VETERINARY SCHOOL OF BERLIN, A HIGH SCHOOL.

Dear Sir: October, 15, 1887.

I read in the October number of the "American Veterinary Review" under the rubric: Grand example from America followed in Europe; the elevation, by imperial decree, of the Veterinary School, at Berlin, to the rank of University—and the reporter in conclusive viewing, speaks of this fact as—highly flattering of the American view of the estimation to which veterinary science is entitled to, the Imperial Government of Germany has merely followed an established American precedent, etc.

I beg to state that this a great mistake. Long before America has had universities of European character, there have been faculties for veterinary science at several German universities, viz: Göttinger, Giessen, etc., and the writer has been a veterinary student and—civis academicus—of the university at Geissen with full academic privileges.

I believe the mistaken is a faulty translation. Firstly, a university can logically be only a community of all sciences; and secondly, the German Imperial decree say: Hochschule—high school. There is, indeed, a great difference in the definition of a German and American high school, but in Germany the veterinary school is raised by virtue of this title to the highest dignity.

Properly speaking every possible way in the studies at the German veterinary schools has anciently been equal to academic forms and the new mode is a mere advantage to the administration of those institutes, than anything else. Nevertheless the veterinary profession of Germany is yet arrived at the highest pitch of honor. You would greatly oblige me by publishing this explication.

Very truly,

O. Schwartzkopff, V.M.D., U. S. Army.

AMERICAN VETERINARY REVIEW,

DECEMBER, 1887.

EDITORIAL.

AMERICAN VETERINARY REVIEW PRIZE.—Conditions to fulfill—a committee of five to be selected—first offered with that offered by the United States Veterinary Medical Association, it is now offered individually—no connection with any other—the selection of the judges will be made with care, and their decision final—original researches and *original* papers only will be rewarded—by this action we hope to encourage the work of all, and offer it with no object in view but the advancement of *American veterinary science.* INFECTIOUS ORIGIN OF TETANUS.—An old idea revived—it stimulates investigations—Dr. Shakespear, of Philadelphia, one of the first on this continent—Nocard of Alfort experiments—the discovery of Nicolaier in 1884—an anærobic bacillus—its presence always found at the point of inoculation or in the tissues surrounding—is it the bacillus then or the ptomaines?—those discovered by Brieger—conclusions of Director Nocard—his suggestions—they are good to follow, but will veterinarians listen to them? TERRITORIAL VETERINARY POSITION IN WYOMING.—Dr. Hopkins wishes to retire—his place vacant next March—lots of applicants—our suggestions for the selection of his successor.

AMERICAN VETERINARY REVIEW PRIZE.—The sum of *One Hundred Dollars* is again offered by the editorial staff of the AMERICAN VETERINARY REVIEW for the best *original* paper on a subject pertaining to veterinary science, the special topic being left to the discretion of the author.

Competitors for this premium must forward their contributions for publication to the office of the REVIEW (141 West 54th Street, New York City), before the first of April, 1888, each paper being distinguished by a special motto, and accompanied by a sealed envelope, enclosing the name and address of the

author, and endorsed externally with the distinguishing motto, for identification.

The prize will be awarded upon the verdict of a committee of five veterinarians, to be selected from the ranks of the profession at large throughout the United States.

The names of the gentlemen composing the committee of award will be announced in a future number of the Review.

For a number of years it has been the custom of the United States Veterinary Medical Association to award prizes annually to the authors of the best papers upon ordinary topics presented before that body; and not long since, the staff of the Review, after due consideration, concluded, by way of improving the idea, also to offer a prize additional to that of the Association, and which should be disposed of under their immediate auspices. This suggestion was kindly accepted, and for two years past the object intended—viz., that of stimulating study by exciting competition—seemed to be satisfactorily realized.

Certain unforeseen complications, however, have been recently developed, which appear to indicate the propriety of an independent action in this matter on the part of the Review, and the arrangement recently in existence may therefore be considered, for the present, as terminated.

But in view of the benefits which must accrue from the mere process of preparation, and the accompanying efforts of those who are to participate in the proposed competition, through the investigation and study necessarily involved in the work, and to insure the advantages which must inure to the interests of veterinary literature in the United States by the publication of original dissertations which shall be a credit to American veterinary institutions and practitioners, we to-day announce our purpose to continue to present the inducements, though under somewhat altered conditions, which we had before offered to our friends and colleagues, with only the change already indicated. And we are confident in our judgment that in making this change we are adopting a course which cannot but enhance the value of the verdict which should constitute the chief value of the prize to the successful contestants in the coming years.

In the selection of the committee of award we shall use every endeavor to secure the services of gentlemen of qualifications and repute such as will leave no room for question or dissatisfaction as to the soundness and disinterestedness, and consequent value, of any decision they may pronounce.

We trust that our endeavor to encourage the habit of original research and to promote the literary tendencies of our colaborateurs, will be recognized and seconded in the same spirit in which it has originated, and that the result will be alike gratifying to ourselves, and in no small degree favorable to the cause of American veterinary progress, both in acquirement and in authorship.

Infectious Origin of Tetanus.—The attention of our readers has been directed, in former numbers of the Review, to a new theory of the origin of tetanus, propounded by certain European writers, who suggest or affirm the parasitic and infectious nature of the disease.

The idea attracted more or less notice by its novelty; and notwithstanding the discouraging reception encountered by the advanced opinion, and the disparaging remarks of doubters and deniers, investigations were not lacking, and experiments were soon instituted for the purpose of testing the question and elucidating the true status of the new hypothesis.

Among these, as we are informed, is Dr. Shakespear, of the Veterinary Department of the University of Pennsylvania, in Philadelphia, the first on this continent, we believe, who has been engaged in the practical demonstration of the subject, but with what result we are as yet unable to say, his investigations being still in progress and as yet incomplete and unreported.

Director Nocard, of Alfort, however, in a recent number of the *Recueil de Medecine Veterinaire*, reports a series of experiments made by him, which bear strongly in favor of the correctness of the alleged parasitic and infectious nature of lock-jaw.

Numerous experiments have also been made and recorded by Arloing, Tripier, Nocard, Carle and Rattone, Rosenbach, Giordano and Bonome, in which the inoculation of the pus of tetanic patients has been followed by the appearance of the disease—the

same result being attained when horses have been used as subjects of experiment as when the test was made with other animals.

Nicolaier, in 1884, reached the conclusion, after long research, that the tetanic symptoms were due to the action of an "anaerobic bacillus, linear-rod in form, with one extremity presenting, first, a little enlargement which colored very easily, and at a later period a spore which colored very slightly only." But neither Nicolaier nor any of the investigators who followed him, ever succeeded in obtaining pure cultures of that bacillus. And yet, in all the microscopic examinations subsequently made, the same bacillus was found in various quantities in all the structures taken from tetanic patients, viz., in the pus found at the points of inoculation, in the skin, and the infiltrated tissues surrounding it. Director Nocard, in a new series of experiments made with the pus which covered and had dried on wooden clamps used for castration and taken from horses that had died from lock-jaw, has reached the same conclusion, and has found in the subjects which died during his experiments, that the bacillus of Nicolaier was always present, but only remained localized at or near the seat of the wound which formed the starting point of the disease. The nervous structures, the blood of the general circulation, the lymph and splenic pulp, are not generally virulent.

The explanation of the special action of this bacillus, so limited in number, probably resides in the theory, now in dispute, of the general action of microbes which are supposed to secrete toxic products, called *ptomaines*, which are true alkaloids, endowed with excessively powerful toxic properties, and which seem to have been exposed by Brieger, of Berlin, who found four of them in cultures made upon sterilized meat, viz., tetanine, tetanotoxine, spermotoxine, and toxine.

In giving his conclusions from his experiments, Director Nocard says: "They prove once more the infectious nature of tetanus, its inscontability, and the long resistance of the contagium to all natural causes of its destruction.

"They throw a great light on the pathogeny of the epidemics of lock-jaw following castration. They prove that these epidemics are the involuntary act of the operator who unconsciously carries the germ with him to distribute to his patients.

"They prove that the veterinarian can in a very great measure avoid them by thorough antiseptic precautions in reference to his person, his clothes and his instruments, all of which may act as vehicles of contagion."

All this can be avoided by such simple antiseptic measures as soaking the instruments in a solution of bichloride of mercury (1 to 1,000), washing the hands of the operator, and cleansing the seat of operation; in short, by the application of all those precautions which at the present time are among the grandest discoveries and noblest evidences of progress in operative surgery, and of which, unfortunately, veterinarians are as yet too slow to avail themselves.

Territorial Veterinary Position in Wyoming.—The Cheyenne *Sun* contains intelligence of the contemplated retirement of the present Territorial Veterinarian of Wyoming from the position of which he is now the occupant.

Dr. Hopkins, the gentleman who fills that place, announces his intention to vacate his office upon the expiration of the term for which he was last appointed, on the 31st of March next. He has given formal notice to that effect, and from private and direct information we feel authorized to say that in this case Dr. Hopkins, as usual with him, means what he says.

The position and the emoluments which the Doctor relinquishes are tempting, and we have no fear that there will be anything like a dearth of aspirants to the succession among the veterinarians of the land. Indeed, we understand that they are already materializing, and the appointing power need be under no apprehension that the duties of the office will go unfulfilled because our brethren are all too diffident and undemonstrative as to their own merits to suggest their own names in connection with the post and—not to say its pay—its duties. But a point less easily disposed of than the discovery of a willing recipient of the appointment, is the question of competency to "fill the bill." In what proportion do those who are fully qualified for the place probably stand, in point of numbers, to those who are principally influenced by considerations of covetousness, in seeking the office? Dr. Hopkins has made himself almost indispens-

able in Wyoming. His was one of the first and earliest of the veterinarian appointments of the West, and he has exhibited qualities of peculiar fitness for his work such as it is the good fortune of but few to possess. He has worked hard, early and late, and has spared himself in nothing in order to meet his responsibilities and prove his faithfulness, and he has succeeded, to the satisfaction of those who not only appointed, but reappointed him, to his post of honor, and who even emphasized their satisfaction and appreciation of his services by awarding him a salary far above that which any other man in the same position has ever received.

We regret for Wyoming the loss she will sustain in Dr. Hopkins' retirement, and we proffer the suggestion that the best, if not the only way in which the services of a successor who shall adequately meet the exigency of the case may be secured, will be to seek, through a properly organized competitive examination, for an accomplished and fully equipped scientist who will combine the cognate acquirements of an accomplished veterinarian with those of a thorough sanitarian.

ORIGINAL ARTICLES.

CHICKEN CHOLERA.

By Prof. E. Semmer, Dorpat, Russia.

Translated specially for the American Veterinary Review from Encyklopædie d. ges. Thierheilkunde.

Syn.—German.—Huehnercholera, Huehnerpest. French—Cholera des poules, Maladie Epizootique des Animaux de basse-cour.

Chicken cholera is an epizootic disease, which chiefly affects chickens, spreads periodically over Asia and Europe, creating heavy losses among fowl. The disease, which manifests itself by vomiting, diarrhœa, anorexia, increased thirst, rapid emaciation, apathy and death with convulsions, was frequently confounded in former centuries with epizootic croupous pharyngitis and enteritis, anthrax, intestinal catarrh and other poultry diseases. The

plague which existed among poultry in Italy in the year 1600, which is described by Androvandi in his ornithology, appears to have been chicken cholera. Moscati noticed the plague in Brescia in 1770. In 1789 Baronio in Mailand described a similar disease, Tytler observed cholera among chickens in India in the years 1817 and 1818 and Searle in 1728. The disease ran a very acute course and postmortems revealed inflammation of the entire intestinal tract. During the cholera epidemics in the years 1830, 1831 and 1832, the disease was observed in Europe and more closely described. Chicken cholera made its appearance first in Russia and Poland in the year 1830, in 1831 in Germany and Hungaria, and in 1832 in Italy and France, and was described by Erd, Radius, Karrer, Grognier, Olivier, Leboucher, Breschet, Carierè, Blachier and Devilliers. Grognier proved that feeding of fowl that succumbed to the disease to dogs and hogs, or the consumption of slaughtered fowl affected with the disease by human beings failed to produce any variation from the condition of health.

In the year 1836, Maillet observed the chicken cholera on the Seine.

In the years 1849–52 the disease again traversed France and was described by Renault, Reynal, Delafond and Salles. Reynal proved the disease to be inoculable; healthy chickens, geese, ducks, pigeons and sparrows inoculated with the blood taken from diseased chickens died in 12 to 48 hours, dogs in 54 to 72 hours, rabbits in 10 hours and a horse in 48 hours; the disease could again be reinoculated from all these animals to chickens, who died in 10 to 48 hours after. Fresh blood (up to 96 hours old), all tissues and fluids, bile, mucus, aqueous humor and feces proved virulent. These experiments were affirmed by Delafond, Renault and Hartmann. Although Hering, Salles and Hahn believed in the infectiousness of the disease by cohabitation or mere contact, the results of the experiments carried on by Delafond, Reynal and Renault proved the negative. In the years 1865 and 1866, the disease was prevalent in Hungaria, and was described by Hartmann under the name of "Huehnerpest."

In the years 1871 and 1872 the disease made its appearance in

the northern part of Italy, where it was described by Sanctarchangelo, and in 1873 Zundel and Moritz observed the same in Elsase and were able to recognize the presence of bacteria in the intestines and blood, without, however, describing them closely. In the year 1876 the disease was observed in East India, and appeared in European Russia in 1877. Here the disease was more closely studied by E. Semmer, of Dorpat; great numbers of micrococci, two-linked chains and rods were found in the intestinal tract and micrococci and diplococci in the blood. The disease was always transmitted to healthy chickens by feeding the intestines of those that had succumbed.

In 1878 the disease manifested itself in France and Italy, and was studied and described by Perroncito, Toussaint and Pasteur. Toussaint and Pasteur produced cultures of the micro-organisms of chicken cholera in urine and chicken broth, and proved that inoculation of these cultivated micro-organisms would produce the disease. At the same time Pasteur was successful in attenuating the micrococci of chicken cholera (by continued cultures, allowing free access of pure, filtered air) to such a degree that chickens inoculated with such cultures only became slightly indisposed, and after that enjoyed a perfect immunity from the disease. This discovery caused Pasteur to prosecute his successful investigations with the contagion of anthrax and erysipelas.

Symptoms.—At the first appearance of the disease the chickens while apparently in the best of health suddenly become listless and dull, have an unsteady gait, roughened plumage, wings hang at the sides, the comb becomes pale and its edges blue, the animals lose their appetite, have great thirst,-a tenacious mucus flows from the beak and nostrils, soon diarrhœa sets in, with the evacuation of thin mucous yellowish feces, sometimes mixed with streaks of blood, colicy symptoms set in, the chickens lay with their legs drawn up to the abdomen, with their eyes closed, and are with difficulty urged to rise.

Nearing the end the temperature falls, the animals become cyanotic, and die either quietly or in convulsions.

Morbid Anatomy.—The bodies of such as have been affected

for a longer period prior to death are much emaciated, at times cyanotic, the feathers around the anus are soiled with their feces of a semi-solid consistency, the tissues have a yellow tinge. The stomachs contain normal quantities of food masses or are empty. The intestinal tract soft, gray, yellow or brownish yellow masses, consisting of mucus, round granulated cells, epithelial cells, food debris, large quantities of micrococci two-linked chains and rods. Mucous membrane of the intestines tender, swollen and ecchymotic.

The villi are deprived of their epithelium and infiltrated with granular masses and colorless blood corpuscles, in part highly injected, its vessels dilated and filled with colored and colorless corpuscles. The liver in the first stage is dark brown, vascular, hepatic cells infiltrated; if the disease has progressed for a longer time, it is yellowish, due to fatty metamorphosis, lungs hyperæmic, foam in the bronchial tubes. Blood discolored, brownish red, thick, contains the like micrococci as in the intestinal tract.

Course and Termination.—The course of the disease is at first, at its first appearance, a very rapid one; the affected animals die either within a very short time or at most 10 or 12 hours. The stage of incubation after feeding upon the intestines of such as have died of the disease is a very short one. Toward the end of an epizootic the disease takes on a subacute character, the disease lasts for several days. The animals sicken not for several days after feeding (up to 14 days) and die frequently only after two or three weeks after taking up the contagion.

The *diagnosis* is easily made according to the symptoms already mentioned, the findings on post mortem examinations and the epizootic form of its appearance. It is not likely to be mistaken for croup (pips) on account of the absence of false membranes in the throat, nor with anthrax on account of the absence of cyanosis of the comb, ecchymosis and blackish brown spots in the muscles, as well as on account of the absence of anthrax bacilli.

The *prognosis* of chicken colera is always bad, as nearly all chickens affected die; toward the end of the plague, however, instances of recovery from slight attacks occur more frequently.

Etiology.—The chicken cholera belongs, like the cholera of man (with which it is, however, not identical) to the miasmatic contagious diseases. It originates like them from Asia, and is produced and spread by a specific micrococcus.

The animals become affected by taking up soiled food and impure water. The disease is most common among chickens, next frequent in geese and ducks, rare in turkeys, guinea hens, pigeons, pheasants and peacocks.

Treatment.—Clean cooked food, clean acidulated drinking water, tannin, sulphate of iron, chlorine, permanganate of potash, carbolic acid, constant attention to cleanliness and ventilation of the chicken houses. Zundel recommends infusions of pine-tops.

Sanitary Regulations.—Immediate separation of the healthy from the diseased, prevention of the importation of new chickens during the prevalence of the plague. Grouping of the fowl, cremation or deep burial of the dead, isolation of the diseased into separate sheds, which may be afterwards thoroughly disinfected or burnt.

For disinfecting purposes boiling water with mineral acids and chlorine are adequate. The exportation of chickens from infected places is to be prohibited.

DISTOMA IN LIVERS AND LUNGS OF CATTLE.

By Cooper Curtice, D.V.S.

I wish to record in your journal an additional instance of the presence of distoma hepaticum in the lungs and livers of cattle in this country.

On the 4th of June last, while examining the viscera of cattle for intestinal parasites, three out of a herd of twelve from Kansas were found to be infected with flukes.

Of these three I accept one case on the authority of Mr. Samuel Collins, the butcher who called my attention to them by describing the "black, rotten liver" he had found on the day before.

The second case was affected in the liver only. The liver

had the characteristic rotten appearance, and the gall ducts were enormously thickened and enlarged. In cysts of the latter and in the mass, apparently, of the liver, were the flukes.

The third case was affected in the lungs only. The right lung had one large fist-sized tumor; the left two, located near the middle of the mass. These tumors were composed of smaller cysts in which were the flukes, calcified masses, and a brownish fluid. Two other animals of the lot had livers containing yellowish, cheesy masses, about the size of a hazel nut, scattered throughout their substance; whether these masses were caused by the distoma is uncertain. I could discover no differences between the flukes from the liver and lungs further than that those from the latter were smaller and lighter in color. I accordingly have classified them as one species.

In an old scrap-book, associated with other articles taken from the New York *Tribune* of 1870–'71, I find one by Joseph H. Batty recording the finding of liver flukes in the Virginian deer. The species is undetermined, but closely resembles D. hepaticum, which it probably was.

In the June number of the VETERINARY REVIEW of 1882, on page 100, Dr. A. J. Murray describes distoma as infecting the lungs of three out of nine Texan cattle examined in one of the Detroit slaughter houses. He quite accurately describes all of the lesions which may be found; and he was the first to record their discovery in this country. If every discovery of the fluke in this country were recorded, we could soon have data to base a knowledge of its distribution on, and could thus arrive at some just estimation of the damage caused by them.

The presence of distoma in the lungs of cattle has been known in Europe since 1869, at least, and has been recorded at intervals as follows:

Rivolta records it, in 1869, in Italy. *Bull. Soc. Centrale de France*, 1881, p. 68.

Hedley found it in Dublin, Ireland, April, 1881. *Veterinarian*, 1881, p. 374.

Lindquist, in Stockholm, Sweden, in 1882. *Sidekriftf Veterinar Medicin*, 1882.

Raillet detected it in France in 1885. *Bull. Soc. Centrale de Med. Vet.*, 1885, p. 285.

Morot detects them in the same country in July, 1885, and states that in the lungs of 2,458 cattle examined, over 4 per cent. were infected with distoma. *Bull. Soc. Centrale*, 1887, pp. 38 and 64.

Duguid detected it in Edinburgh, Scotland, in April, 1887. A. C. Cope, in *Veterinarian*, June, 1887, p. 386.

Littlewood detected their presence in the lungs of sheep in Egypt. *Veterinarian*, August, 1887, p. 546.

These discoveries have all been made independently, the greater number having occurred within a year or two. For some reason, they have all occurred in the spring; probably because the fluke is at that season large and present in the tumors he causes. There is reason to believe that these tumors have been seen before, but ascribed to different causes, as echinococcus, etc., the fluke being absent or overlooked.

The frequency with which distoma frequents the lungs presents to us another phase in its life history which has not yet been sufficiently studied. The most rational theory to account for its presence there is that the embryo has passed along the trachea instead of the œsophagus, and developed in the bronchiæ instead of the gall ducts. More facts will, however, point out to us the truth of the matter.

TEXAS FEVER AND OTHER DISEASES IN MISSOURI.

EXTRACTS FROM THE STATE VETERINARY INSPECTOR'S REPORT FOR THE FIRST QUARTER UNDER THE VETERINARY ACT OF 1887.

The number of miles traveled officially in the last three months is.....	5,760
The number of counties visited on request, among which several were visited four or five times.....	17
Number of cattle put in quarantine as capable of communicating Texas fever.....	677
Number of deaths from Texas fever, as gathered in personal inspection....	298
Approximate number of deaths by Texas fever in the city of St. Louis, as gathered from various sources, and exclusive of the above.....	506

One inspection of contagious diseases was made outside of the

State of Missouri, with a view of preventing introduction within our borders. This was the investigation of the contagious disease brought into Illinois among the valuable imported breeding horses, stallions and mares, and which proved to be what is known as "maladie du coit," a syphilitic malady of the equine specie, hitherto unknown in America, but existing in Africa, and occasionally imported into France, whence it came to this country.

Number of horses quarantined for glanders	9
* Number of horses or mules killed, solely by request, on account of glanders	13

(About twenty-eight head had died previously in connection with these cases).

Number of deaths by a malignant form of charbon, or anthrax, as follows:

Cattle	8
Horses or mules	5
Hogs	7
Dogs	1

Two men are now suffering, and far from saved, apparently from *malignant pustule* contracted in skinning one of the aforesaid cattle. These deaths have all occurred in two outbreaks. The first, in the county of Vernon, killed the five horses or mules and six cattle, on one and the same pasture, at short intervals, while a few other cattle are supposed to have also died from the same malady, judging from reports given me. The latter outbreak was in Livingston County, where two cattle died first, then the hogs and a dog that ate flesh of the carcasses.

TEXAS FEVER.

ANTHRAX DISEASE, SOMETIMES CALLED SPANISH FEVER, SPLENIC FEVER, ETC.

The most prevalent disease which the Veterinary Inspector was called to attend this summer was Texas fever, so called.

Indeed it broke out at so many places at short intervals that this officer was frequently unable to do justice to sufferers from

* One man, Mr. H. S. Pierce, of Burlington Junction, Notaway County, Mo., is now himself suffering from glanders. He was accidentally inoculated in treating a horse that I ordered destroyed recently. This is the fourth case of glanders in man brought to the notice of the State Veterinarian in the last three years.

this or other maladies. Occasionally calls could not be attended to for several days after their receipt in this office. He says:

During my official labors in the past three years, I have had opportunities of observing this dreadful and destructive affection under a variety of circumstances. It is probably the most fatal malady that attacks cattle in this climate, and by far the most damaging in this State. The estimation of the losses it causes in Missouri alone must go up high into the thousands of dollars. The number of deaths recorded by one man alone, in the discharge of his complicated duties during three months, would amount to more than $14,000, at a very reasonable estimate. This does not include the great number of deaths reported by correspondence, nor the number that occurred in St. Louis alone, which would swell the sum to more than double that amount.

Besides all those, how many cases have occurred that were indirectly reported, or not reported at all?

In view of the errors committed in dealing with Texas fever, I respectfully submit to the people a few suggestions which, if studied without bias (putting in practice what is practicable), cannot fail to prove beneficial, and diminish the loss to a great extent. This is one of the diseases that our laws fail to keep out; therefore, until we have them improved, it behooves every stock owner to be well acquainted with its nature and peculiarities. Let every stock man and farmer study them. I will write without technicalities. I do it for the layman's benefit, and not for the professional or scientific.

1. Texas fever, or splenic fever, so called, may be termed a deadly blood disease of a dangerous character and due to the introduction into the organism of native cattle of a "germ" brought here generally by certain Southern cattle, which take them on Southern soil.

2. Southern (or other) cattle born on Southern soils where those germs exist, acquire immunity against the disease, and thus may, without danger to themselves, carry the germs of the malady in their bowels and deposit them on our land where natives may injest them and become inoculated, just on the principle that a man vaccinated against small pox has acquired immunity

against this disease, and may carry its germs accidentally in his clothes, or perhaps purposely in his pocket, and give it to others without getting it himself.

3. Horses, native cattle, etc., may sometimes, in favorable circumstances, carry the germs of the disease from farm to farm, highway to pastures, cars to pens, etc., by the agency of manure or other droppings of Southern infectious cattle. There is some doubt about the capability of diseased native cattle to spread dangerous germs emanating from their own malady. I am not prepared to say that this *never occurs*, although it may only in extremely rare and peculiar circumstances.

4. Good frosts kill the virus that may be stricken thereby, but in certain localities frosts may never be strong enough to kill it for some time after the first one. The months of April and November are, as a rule, not sufficiently cold during their whole period to effect disinfection; and indeed I have on record cattle that were brought into Missouri in the latter part of February or first days of March, that disseminated germs causing the development of Texas fever later in the warmer months.

5. Consequently infected pens, barns, and especially pastures, may be considered dangerous between the last good frosts in spring and first *heavy ones* in fall—*not the very first one.*

6. Washing, scrubbing, disinfection with carbolic acid lotions, chloride of lime, and other mild antiseptics, are not always sufficient to kill all virus and prevent danger.

7. Public stock pens, yards, cars, unfenced railways, are common distributors of the germs of this affection as well as of some others.

8. The germs of the disease, it appears, may cause the malady several months after their spread in our fields or other places in our climate.

9. Acclimated Texas cattle, when they have passed a certain time, including a winter, in this country, are subject to death by the effect of Texas fever the same as are natives. There may be some exceptions to this, and perhaps certain conditions may yet prove variability, but I have observed this occurrence.

10. The germs of Texas fever stay a certain period in the

Southern individual in our climate, during which they are dangerous. The exact duration awaits demonstration.

11. It is idle and foolish to argue, as some people of Texas have done, and to my astonishment, as some reputable newspapers of Missouri have taken up, that there is no such thing as "Texas fever, or "Spanish fever," or "splenic fever." Any man who has had any experience with that malady in his herd can, if he will be truthful and sincere, reduce such childish talk to insignificance.

Now, the above facts being known, the people should not neglect to apply the regulations that are thereby rendered obvious. For instance:

1. Be always, under any circumstances, most cautious in putting *branded* cattle among native stock, for they may have come recently from regions where the germs of Texas fever exist; in fact, it is safer to avoid this practice entirely in summer months.

2. Never import Southern cattle among natives between at least the first of March and first of December.

3. Cars for shipment of native cattle—during these months especially—can never be too thoroughly cleansed and disinfected. In fact, it would pay always to scrub the cars well and then *sprinkle thoroughly*, or better, *immerse repeatedly* the car floor and walls with a solution of *corrosive sublimate*, one part to a thousand of water. It is cheap, and if applied in cars in a locality where there is no grass, no well, no running stream or drinking water, and if the disinfected article be allowed to dry, it is entirely safe. It may be safe with less precaution.

4. Stock yards, pens, alley-ways in public stock markets, should be so arranged that Southern and native cattle may be kept separate and never trample the same grounds, for it is impossible to disinfect sufficiently the stock pens of public markets. They should, therefore, be divided into two sections, one for each class of stock.

5. Southern cattle should not be allowed on the highways or ranges during the months alluded to. In counties where there exists a stock law, this point is less important, and yet it would avoid damage even there.

6. Keep cattle away from *unfenced railway tracks*, public railway stock pens, and places where railway cars are cleansed, and where switching takes place, for we know not at what moment the germs of the disease may be deposited in those places.

7. Of course, *under no consideration* should native cattle and Southern cattle be allowed together, or on common grounds the former after the latter, for then it is running towards danger, unless it be after severe frost.

8. Southern cattle should be considered dangerous for native stock for the whole summer period between severe frosts, until it is positively proved how long they can transmit the germs of Texas fever. Pastures remain infected till well frozen.

9. So far as I can judge, medical treatments are of little or no use as curative or preventive. Nature is perhaps slightly assisted in supporting the disease, when the bowels are kept open with green food; for instance, green corn, assisted by raw linseed oil.

Diagnosis.—A mistake can hardly be made in diagnosing this disease. Its lesions and symptoms may resemble, to a certain extent, those of so-called *essential charbon*, or essential anthrax, and it may be necessary sometimes to withhold an opinion for a while regarding the cause and origin, especially when no satisfactory conclusions can be immediately arrived at on the grounds, or from the history of the animal, and that for certain reasons a satisfactory investigation cannot be made immediately before leaving the spot. But the *nature* of the malady can always be told if sufficient symptoms and lesions can be seen by an expert.

Symptoms.—I do not intend to describe here all the numerous symptoms of Texas fever, but I desire to draw the attention of the people to a few striking and characteristic sights and lesions which even the unexperienced may recognize to advantage, and thereby avoid perhaps great losses.

The animal's head is carried low, nose near the ground; milk suddenly disappears; appetite rapidly disappears; rapid loss of flesh and rapidly increased gauntness, or hollowness of flanks; a slight cough sometimes occurs, and occasionally also a little

bloody fluid ruins out from the nostrils. These are not common.

There may be either slight diarrhœa or constipation, and blood, in small quantities, sometimes oozes from the bowels with the natural discharges. The subjects soon become very weak, have a reeling or staggering gait, particularly noticeable when pushed sideways on the hip; the form of staggering suggests to the mind the unsteadiness of alcoholism, or the "drunkard's reel;" more or less slobbering sometimes occurs at the mouth; stupidity becomes extreme; weakness soon becomes such, in many instances, as to force the animals to lie for comparatively long hours, and then they seldom can rise without strenuous efforts, if, indeed, they can rise at all.

During the increase of these symptoms the patients may be seen to pass highly-colored urine, which gradually becomes darker, and finally assumes the hue of coffee, with a thicker consistency. Death may occur in thirty-six hours or several days after the appearance of the first dumpishness. In the majority of outbreaks the disease has had a duration of two to three days, in my experience, but some live five or six days. Ten to fifteen per cent. recover, and a very few die from the effects of a relapse occurring after one or two weeks of convalescence.

In opening the body the blood will be found black and fluid, not coagulated and solid in the veins or arteries. The inside of the heart (endocardium) may present irregularly-shaped dark-colored patches or stains, not elevated sores; the lungs (lights) occasionally may be found congested—*i. e.*, impregnated and darkened with blood; this is not common, however. The liver may be congested also, and enlarged, but does not appear so dark. The lesions in these organs may be overlooked by those unacquainted with anatomy and pathology; but here are lesions that anybody can detect, and they are *constant and characteristic* of splenic fever: The spleen (melt) is *increased* in size, *darkened* and *softened*. All these conditions of this organ may be more or less marked, however. Sometimes the *inside* of the *covering*—the capsule—is so softened that the substance can be pressed from one extremity to the other, as one could press jelly from one end to the other in a closed sack. At other times, of course, it is

more solid. In tearing the organ open with the fingers we may find it is as easily penetrated as a mass of cooked oatmeal; it has a dark brown or black color, and resembles somewhat thick, but soft, crushed black raspberry preserves. The bladder is generally full of dark-colored water. The kidneys may present some alterations unappreciable to the ordinary observer. Occasionally they are friable and dark.

If the animals were on dry food, the third stomach (manifolds) may be full of hardened, and more or less dry food. This must not lead to the belief of having a case of so-called "dry murrain," as sometimes occurs. This condition of the third stomach on dry food is a reasonable consequence of the impaired digestion and the fever occurring in the disease. When the animals are on soft feed this condition is not observed, or is very slight.

In conclusion, I will say that the stupor, rapid falling off of flesh, increasing gauntness, bloody or dark urine, and soft, enlarged spleen, with a history showing the origin of the disease to have been from foreign cattle, or imported germs, are conclusive evidences of the existence of splenic or Texas fever.

When this is known, the healthy native animals should be immediately removed from where they became sick, and from foreign cattle, and not remove the foreign cattle and leave the natives on the infected grounds, as is frequently done. By this means those that may have, to the date of separation, escaped the infection of the germs, may stay free. Those already infected, however, whether sick or not, may succumb later. I consider it wiser to remove healthy natives from the grounds where the diseased natives are left.

MALADIE DU COIT, DOURINE, ETC.

Under this heading may be described a syphilitic disease of the equine specie—horse, ass, etc. Owing to its mode of transmission, it is naturally special to stallions and mares, but of course may be inoculated to any animal of the equine family. It was spread at different times in European countries by stallions from Syria. It was observed and studied in France, Germany, Russia, etc., and now may be found occasionally among Arabian horses and other breeds on the coast of Africa on the Mediter-

ranean sea—Algeria and Tunis, for instance. It was imported to De Witt County, Illinois, by an imported stallion, presumably from France. Algeria being a French possession, we may imagine how the disease may have come from there, and thence here.

So far as I could gather from various sources in my personal investigations of that disease so near our borders, six imported stallions have died from its effects, and fifteen diseased are now in quarantine. Three hundred and ninety-six mares were bred to affected or suspected stallions, seventy-five of them became affected or are suspected, and 48 per cent., according to some, 50 per cent., according to others, of the mares that became diseased have died from it. On account of the breeding records kept, it was comparatively easy for the State authorities to trace every suspicious case that had not left the State. So far as known, only three cases—one stallion and two mares that were exposed—have left Illinois for parts in Nebraska, Michigan and Massachusetts, respectively. All dangerous stock is strictly quarantined.

The disease is a severe blow to the farmers of De Witt County, Illinois. In order that our horse-raising industry may not suffer from the same source, nobody should buy brood mares or stallions from the county above mentioned, especially from the neighborhood of Clinton, without a certificate of health from the State Veterinarian of Illinois, or some of his regularly appointed assistants. In fact, the same precautions should be taken in buying such stock in the neighborhood of De Witt County for some time to come.

The disease is a slow progressing one, but generally fatal or incurable, and very hideous in appearance. In due season I shall describe it to the people, as I intend to do a few diseases that seem to be transmitted more or less directly by heredity, and which the agriculturists of the State should know and understand.

In my next, or some future report, I intend to write again concerning glanders. I had very little time during the last three months to attend personally to outbreaks of this malady.

Respectfully submitted.

PAUL PAQUIN, M.D., V.S.

MALADIE DU COIT.

By J. D. Hopkins, D.V.S.

[Extract from his Report to the Stock Growers' Association.]

(*Continued from page* 354.)

STALLIONS.

In the benignant form in stallions the symptoms of the disease do not appear to be so marked as in the mare, and not unfrequently several weeks pass away without any indication of its existence being manifested; at other times it appears in a few days after *coitus*, as an indolent, œdematous, but intermittent inflammation of the prepuce; and in some cases there is œdema with collapsus of the penis.

The disease may become aggravated and malignant, as in the mare.

In the commencement of the malignant form of this malady in stallions, the symptoms are sometimes so trifling that they are likely to pass unperceived, especially if the disease is unknown in the country.

Its primary manifestations are uncertain; sometimes it appears early, at other times there is a long lapse before its presence is ascertained; and again, it may remain latent and only develop itself after the excitement of coition.

One of the first symptoms is swelling of the prepuce, which increases in volume; the infiltration extends behind to the scrotum, and is limited in front to the extremity of the sheath, where it forms a semi-circular ring; though it may spread beneath the abdomen to the sternum, the skin being infiltrated and thickened, and on the sheath smooth and shining, while the swelling itself is doughy and indolent. This is frequently the only symptom visible for a long time, and stallions have had it for eight, ten and twelve months before other symptoms were exhibited.

After a certain time these local symptoms are accompanied by others of a general character. There is dullness, pawing, and loss of condition, though the appetite is unimpaired.

In some cases the testicles remain healthy; in others they are larger, pendant, and betray more or less morbid sensibility.

In order to examine the penis, a mare should be presented to the stallion, which, at the commencement of the affection, has lost none of his ardor; though, at a later period, this decreases until copulation can scarcely be effected. The penis, when completely erected, in the majority of cases offers nothing abnormal; sometimes the mucous membrane is redder, especially at the transverse ridges, and it may even bleed at certain points, but this is not a distinctive feature of the disease, being frequent with stallions which are much used. At other times the penis has a faint bluish or violet tint, which forms the basis for a kind of a large ecchymotic spot, generally elliptical in shape, varying in diameter from one-third of an inch to an inch, and deeper in color than the other portions of the mucous membrane. These spots are neither above nor below the general level.

Other more conspicuous and more numerous spots are observed nearer the glans; these have a yellowish-white hue, which contrasts strikingly with the color of the mucous membrane, and their diameter varies from one-thirtieth to one-sixth of an inch; their border is well defined, though not raised, and altogether they look like the cicatrices of minute superficial ulcers. It is probable that they are the remains of vesicles which have been destroyed. The organ is often infiltrated, and its head is so increased in size that copulation is difficult or even impossible.

Some observers have noticed atrophy of the penis and testicles.

When the stallion has been put to the mare, it is remarked that after the genital excitement has passed off, the penis is not retracted within the prepuce as usual, but remains in a state of semi-erection for hours; and even after this has passed, it hangs beyond the prepuce, soft and wrinkled, to about the extent of an inch; usually micturation is frequent, and it sometimes requires a long preparation, the efforts appearing to be painful to the horse. The animal stretches, separates the posterior limbs, while the penis is protruded and pendant, and these manœuvres may be repeated several times before any urine is passed; this takes place by a little uninterrupted jet, the thickness of a quill, and the fluid is thick, yellow, and viscid like synovia.

It has been found to contain albumen. After micturation

the horse paws and appears uneasy, as if the urine irritated the urethra.

The disease may remain for a long period limited to the swelling of the sheath. After a time it is perceived that the animal is not so vigorous as usual; rests more frequently, and does not evince much ardor when mares are exhibited; as yet the appetite is good, but there is loss of condition, and also gradual emaciation, which is scarcely noticeable until after several weeks or months; the coat looks dry and the skin tight and inelastic, and the slightest pressure on the loins causes the horse to evince symptoms of tenderness. Soon afterwards difficulty is observed in walking; there is swaying of the croup, and apparent weakness of the posterior extremities, standing is fatiguing, and the hind limbs are alternately rested twenty or thirty times a minute; still later, when trotted the animal goes as if its loins were affected; the croup swings from side to side, and it, as well as the hocks, is much flexed when the pace is suddenly checked.

There is a marked lameness of the hind or one of the fore limbs; most frequently it is confined to the right hind leg. The hip joints are painful, and when the hind feet come to the ground they are jerked up again, as if the horse was affected with string-halt. At times the weakness is so great that the animal falls to the ground like an inert mass.

These symptoms are intermittent. A horse that goes lame to-day may not be lame two or three weeks hence; then the lameness will again appear, and diminish or increase until the feebleness terminates in death.

There is tumefaction of the submaxillary lymphatic glands, and those in the inguinal region, and a discharge from one or both nostrils, while the eyes are lachrymose. At an advanced stage of this disease the appetite is variable and capricious; the food is eaten slowly, and the hay is often held listlessly between the lips, as if the animal forgot it was eating, or the jaws were fatigued.

In some cases a peculiar symptom is remarked; this consists in excessive pruritis confined to the posterior extremities, and which persists until death ensues. The stallion gnaws itself about

the pasterns and feet so continuously and severely as to produce serious wounds. At other times it seizes its manger or anything else accessible with such savageness that the teeth are sometimes broken in their sockets. In other cases very peculiar nervous symptoms, epileptiform in their character, appear. At the approach of a mare the stallion will be seized with a kind of spasmodic trembling; the muscles of the neck stand out in strong relief; the head is extended and shakes convulsively; the lower jaw moves from side to side; the eyelids, widely dilated, expose a large surface of the eyes, the schlerotica of which appears of a bright yellow color, while the organs themselves roll about in their orbits in a strange manner; and the respiration is snorting and excited, the nostrils being widely expanded. These singular phenomena persist until the animal has gained sufficient energy to attempt copulation. At a later period the sight of a mare does not occasion more than a nervous trembling, which is also produced by the ingestion of cold water.

The voice diminishes in sonorousness and strength, and can only be heard a short distance away, sounding husky and nasal.

The diagnosis of the disease is more difficult in the stallion than in the mare, unless the local disturbance is accompanied by the secondary nervous symptoms already noted. Observation of the consequences resulting from coition, however, soon testifies as to the soundness of the animal; for if it has a chancre in the urethra it will transmit the disease to the mares it has been put to, though apparently in good health.

As a rule, the progress of the disease is slow, and its termination most frequently fatal, though the result cannot always be predicted with certainty. With some animals which are apparently much advanced in the malady—even as far as the paralytic stage—recovery will at times occur; while with others which are evidently only slightly affected, it progresses gradually to a fatal termination, in spite of all treatment.

It is liable to intermissions and remissions or paroxysms. The swelling of the prepuce may be the only symptom for a long time, and this should arouse suspicion, especially if the horse has come from an infected locality; and particularly if there is weak-

ness of the hind quarters, lameness, knuckling over at the fetlocks, and loss of condition without impairment of the appetite.

The disease may continue from three months to three, four or even five years. The mortality varies from 40 to 70 per cent., according to the constitution of the animal, condition, manner of keeping, and climate of the country. The mortality is greater among stallions than mares.

The contagium of this disease is "fixed," and from what is at present known of it, is only contained in the secretions of the genital mucous membrane (that lining the urethra of the stallion and the vagina of the mare), and in the vesicles or ulcers.

It does not exist in the blood. It is inoculable, and at times very potent; but it does not appear to have any action on other than equine and asine species.

The contagium obtains access through the generative organs, and we have no evidence to show that it may be received in any other channel.

It is transmitted from the stallion to the mare, or *vice versa*, in the act of copulation. The highest bred animals are the most susceptible.

The duration of the latent period does not appear to be fully determined. Maresh says it varies from eight days to two months. Haubner gives it an incubative stage of three to six days in the benignant form. The same authority states that the malignant form may be longer than two months in appearing. Viardot gives it fifteen days to two months. Venereal excitement appears to diminish its incubation, as it also tends to induce its more rapid development when it has appeared. Owing to the long stage of incubation and duration of the malady, it may be carried to the more distant regions by one infected animal.

From the figures at present accessible, it would appear that of the animals exposed to the infection about one-third become diseased. Cohabitation, without actual contact, will not produce the malady.

A study of the above disease will repay those interested in horse breeding, and I recommend to their consideration Fleming's

Sanitary Science, Williams' Principles of Veterinary Medicine, and Liautard's translation from Zundel, works which I have drawn upon in describing the symptoms of maladie du coit. These books contain an exhaustive description of the symptoms, pathology, treatment, post-mortem lesions and sanitary regulations necessary to control or stamp out the contagion.

As this outbreak among the horses in Illinois is the first appearance of maladie du coit on this side of the Atlantic ocean, veterinarians called in to advise did not at first recognize the disease. It was only when the malady became widespread, and in the number infected presenting all the different characteristics, that its peculiar nature became understood. This delay in diagnosis has been the cause of much loss to horse breeders in Illinois, which might have been, in part, at least, avoided, if the owners of the suffering animals had early reported to the sanitary authorities of the State.

In the preventive of the spread of maladie du coit from Illinois much, indeed everything, will depend on the intelligence and experience of the breeder, whose interests will not allow him to purchase breeding stock in an infected locality, because of the grave liability of carrying a pestilence to his home herd. Veterinary inspection will fail to detect the disease in the benign form, and the *benign form is just as contagious as the malignant.*

Legislation should be had in every State, giving the sanitary authorities *ample* power and means to quarantine all suspected animals, and to *kill* all that develop the disease; to castrate all infected stallions, and thus prevent their use forever as sires. As the disease has invaded our country through a neglect of the enforcement of sanitary laws, I am of the opinion that the Government should indemnify all owners for animals destroyed because of this disease. The State, in granting an indemnity for horses afflicted with maladie du coit, insures the prosperity of the people by making it to the interest of all breeders to report the existence of the disease to the sanitary authorities, who may at once take such action as will prevent its spread. In a community devoted to the horse-growing industry, this disease is much to be dreaded, because of its peculiar nature; the manner of its spread;

the fact that it resists remedial agents; its mortality; and the ease with which it is transported from herd to herd.

There is no doubt but that the sanitary authorities of Illinois will do all that is possible under their laws to prevent an extension of this plague from its present locality. But it seems to me impossible for them to hold in quarantine the two hundred mares and nine stallions affected with this disease for a term of *three years;* and it must be remembered that these animals are owned by about fifty different farmers, widely separated.

It is not reasonable to suppose that these quarantined breeders will submit to the official supervision of their herds for such a long period; and in this country, with our present sanitary laws, it is folly to imagine that the Live Stock Commissioners of Illinois will be able to successfully maintain a three years' quarantine. While maladie du coit is confined to the horses of De Witt County, Ill., it would be a profitable investment for the State to pay for and slaughter every infected animal. The expense would be trifling in comparison with the immense capital invested in breeding horses.

Already the confidence in the horse traffic (breeding stock) is shaken, and the people of Illinois who by their foresight and energy have created a large trade in Norman-Percheron stock, and have thus added to the material wealth of the country, must lose their business or remove to more favored and healthy locations.

If Wyoming buyers of breeding stock (horses or mares) would preserve the prosperity and integrity of their herds, they *must not* make their purchases in a district where maladie du coit prevails.

The Respiration in Paralytic Rabies.—An account of some careful observations on the respiratory rhythm of rabbits suffering from artificially induced rabies is given by Dr Ferré in the *Journal de Médecine de Bordeaux*, No. 1 (Aug. 6th). The graphic tracings show very clearly the gradual change in type of the respiratory rhythm, which is normally composed of short rapid waves, as seen in the tracing; the respirations become slower and deeper, so that just before death they are six times less frequent than during health. Ferré proves that the first phenomenon of rabic infections is a distinct slowing of the respiration.

THE NATURE OF THE AMERICAN SWINE PLAGUE

IN REGARD TO ITS PREVENTIVE TREATMENT BY VETERINARY POLICE AND HYGIENIC METHODS.

By Frank S. Billings, D.V.M.

Director of the Experiment Station and Laboratory of the University of Nebraska for the Study of Contagious and Infectious Animal Diseases.

[Read before the Massachusetts Veterinary Association by its Secretary, Dr. L. H. Howard.]

(*Continued from page* 358)

SWINE PLAGUE IS AN INFECTIOUS DISEASE.

Both contagious and infectious diseases have causes other than the one specific or exciting cause, the inficiens proper.

The most striking of these etiological influences, and the one in general most difficult to combat, as well as the one which we know absolutely nothing about, except its existence, and probably never shall know anything more about it, is the racial, or species, cause—a *causa interna*—that peculiar unknown factor which exists in the greater number of individuals, in certain species of animal life, which of itself predisposes such individuals to certain diseases to which the individual members of other species have no such predisposition. This condition is known as the natural, or racial, predisposition. The human race has this natural predisposition to the measles, mumps, scarlet, typhoid, typhus and yellow fevers, cholera, syphilis, etc. In fact, unfortunate humanity seems to have been especially selected by nature as an example of this natural predisposition. Why we don't know. It certainly is not because

> "In Adam's fall
> We sin-ned all."

No sensible man believes such "rot" as that, now-a-days. The bovine species has its contagious lung-plague and rinderpest; the canine its rabies; the ovine its variola, or pox; and the porcine its swine-plague. Other diseases of this nature, while primarily developing in (contagion) or infecting a given species, are still susceptible of accidental (not natural) extension to other species—glanders, foot-and-mouth disease, small-pox, rabies (again), the German "wild-seuche," etc.

This transmissibility, I wish again to emphasize, has nothing to do with the natural peculiarities of such diseases in most cases. It simply shows that they are capable of inoculative transmission, either by accident or experiment.

Although we know absolutely nothing as to the physiological conditions upon which this racial, or natural, predisposition depends, still empiricism has shown its existence to be a most expensive biological fact. To its existence are directed all our endeavors at prevention by means of artificial inoculation with a modified virus—a subject I will not touch upon further at present.

It is generally a much easier question to arrive at the fact that a given disease is contagious (if we only know what we mean by that word), and to combat the extension of such a disease, than it is to understand and successfully prevent such an infectious disease as the swine-plague or the Asiatic cholera.

In the first, we render all contact impossible between healthy and sick or exposed individuals or their surroundings. In the case of animals, we kill the diseased ones, and if necessary the exposed; we air the stables and subject them to a suitable cleansing and disinfecting, and our work is done.

In other words: In contagious disease we seek to do away with the living, movable, primary centers of contagion, or to so restrict the movements of such objects, that no susceptible organisms can come in contact with them. In infectious diseases we have to do with numerous fixed centers of danger (infection) as well as numerous living, moving, transient centers, capable of causing innumerable newly infested fixed centers of danger. Aside from these, we have the infected material itself, which must be kept local, and also so change these local conditions as to render them unsuitable to serve as a medium of support and development to the inficiens proper.

It is easy to be seen that between two devastating diseases—say, pleuro-pneumonia and swine-plague—it is a much easier matter to stamp out and prevent the contagious than it is the infectious disease.

It will also be found that where vaccination or preventive in-

oculation is possible (small-pox and—it should be said—pleuro-pneumonia), that the same will be found much more practicable in contagious than infectious disease, because in general the former possesses a much greater regularity and constancy in virulence, and because locality plays a very insignificant *role* in contagious disease in comparison with infectious.

A State Veterinarian lately visited Lincoln, Neb., and appeared before the Committee on Live Stock in the Legislature, and gave them the following advice:

"*In order to clear the State of swine-plague, the State authorities should kill and pay for all the diseased and exposed swine in the State, and stop all importation for sixty days.*"

If the above words were truly reported to me, they simply show that that State Veterinarian knows absolutely nothing about the true nature of the American swine-plague.

Were every sick and exposed hog in the United States killed at one swoop—aye, more: were every hog in the United States to be killed and cremated at a given hour on a given day, and all importation stopped for 120 days, or even for 180 days, it would not kill the disease out.

Why?

1. Because it is primarily due to local infection.

2. Because no attention had been given to hog-pens, hog-runs, straw-stock, etc., nor the places where diseased hogs had been buried previously.

These facts make the outlook for preventing the swine-plague rather dark and discouraging at first sight, but it is not so difficult an undertaking as it appears.

1st. All hogs held in small lots, and stock hogs, can be rendered safe by artificial inoculation for one year at least, and perhaps longer.

2d. By the united action of State and railroad authorities, buyers, breeders and owners, the traffic and movement of diseased swine can be rendered next to nothing, and by quarantining all such swine to the infected locality, and then properly treating them, we can soon control the swine-plague; how, will be shown in the appended regulations.

To combat an enemy, we must first discover its nature and resources.

These have been fully demonstrated by my researches in Nebraska, the only assistance I have found being in the work of Dr. Detmers, which so largely supports my own, though done previously.

The preventive treatment of swine-plague must be directed, then, to:

1. All places where the disease exists, or has existed within two years.

2. All sick or exposed swine, or any persons, animals or objects that may have been in contact with such.

3. The conveyances of common carriers.

4. The burial places of diseased swine.

5. The contamination of waterways.

6. Controlling importation.

7. Placarding, with signs marked "*Swine-Plague*" (white letters on black ground), every place where the disease exists or has existed, until declared free from all suspicion by the State authorities.

This regulative and hygienic method of prevention is directed entirely to the supporting or secondary causes of swine-plague. Its purpose is to prevent the action of the inciting cause.

When Swine-Plague Exists in Adjoining or Distant States.

In this regard there are two essential points which demand earnest consideration on the part of the respective State authorities:

1st. Swine-plague introduced by diseased swine from other localities.

2d. Swine-plague introduced by means of uncleansed and non-disinfected railroad cars or other conveyances, the property of common carriers.

Let us consider the first of these conditions.

All importation of swine from another State, either for stock or feeding purposes, whether or not such imported swine come from States or localities in which swine-plague exists, should be

prohibited by law, unless the authorities of the State into which such swine are being imported provide suitable and safe conveniences for the absolute isolation and quarantining of such imported hogs at selected points of entry, so that each lot can be safely and securely confined in a previously cleansed and disinfected hog-pen.

In all such cases the State would be liable should the imported hogs become infected while in the quarantine pens, if the latter had not been previously cleansed and disinfected, or, on account of neglect of duty on the part of any servant of the State attached to the quarantine.

In order that the pens of such a State quarantine station shall constitute a safe and suitable place for such imported hogs, it is absolutely necessary that they be individual pens of variable size, that the walls be made of the hardest bricks and the gates of iron, and if any portion of the pens be roofed that the same be of iron also, and the bottoms made of cement, not pitch, asphalt. The feeding troughs should be made of stone or iron and of such a size as to be convenient to handle and cleanse. The pens should be at least ten feet apart; the passage-way between them should be made of cement asphalt and so graded that the drippings or washing from each pen could not run over to the opposite pens.

The entire quarantine grounds should be paved with cement asphalt and sewered. The drainage from each individual pen should enter the sewer from a trap within the walls of the pen, so that in washing them no material could possibly get outside the pen.

The quarantined hogs should be inspected daily by a competent Veterinary Inspector, for a period of twenty days subsequent to their arrival upon the State territory into which they were imported.

If no evidence of swine-plague or other suspicious disease occurred during that period, the hogs should be declared free and released to the owner.

The State authorities should take such measures as would insure their further transport into the State in cars or conveyances that had been previously cleansed and disinfected under the eye

of a trustworthy inspector, whether said cars or conveyances had been previously used for a transport of swine or not. (Farmers' wagons should be looked upon with suspicion and treated in the same manner as the conveyances of common carriers.) In such cases every means of transport must be looked upon as "suspicious" and treated as such.

Should the swine-plague break out in a lot of imported hogs while thus quarantined, the pen in which they were confined should be cleansed, washed and disinfected daily. All straw and refuse should be carefully removed in iron hand-carts made for the purpose and then burned.

The quarantine station should be provided with a furnace (or oven) for burning such material and for the cremation of the carcasses of any animals that should die or be killed on account of a contagious or infectious disease. The greatest precautions should be taken, in conveying such refuse material or carcasses to the crematory, that nothing dropped upon the passages of the quarantine.

When an outbreak of the swine-plague (or other contagious disease) has come to an apparent end among the quarantined swine, the period of isolation and observation must then be extended at least thirty days from the time the last sick animal had died, or the last suspicious symptoms had entirely disappeared among the lot of hogs that had been affected. At the expiration of that period the hogs may be delivered to the owner unless other suspicious symptoms have made themselves apparent within the allotted time.

The same precautions should be taken in their removal as have been previously mentioned.

Upon arrival at the owner's premises, the latter should be compelled to provide suitable conveniences for a further isolating and quarantining such swine for still another twenty days before he should be permitted to place them among other hogs upon his place. Whenever a lot of swine-plague diseased hogs were thus quarantined the chief inspector of such a government station should detail one person to take the exclusive care of such diseased hogs, and absolutely prohibit such a persons going near,

or having anything to do with other healthy lots of hogs that might be in the quarantine at the same time, or with any hay, straw, feed or utensils destined for the use of the undiseased hogs. The person having charge of the swine-plague diseased hogs should be provided with separate buckets and utensils necessary to their care, and with hay, straw and feed for their use, to be kept in a special place, as near to the diseased hogs as possible. He should also be provided with a suitable disinfecting solution (corrosive sublimate in water, 1 to 1,000 parts) to wash his hands and boots with each time he had been busy about such diseased hogs. Said disinfectant should be kept near the pen in which the diseased hogs were confined. The State government should fix the price per head, for all hogs thus quarantined, and should positively forbid the inspectors from charging owners any extra fees.

(*To be continued.*)

COMPARATIVE LESSONS OF BRAIN WOUNDS.

By Dr. G. Archie Stockwell, F.Z.S.

(Written especially for the American Veterinary Review.)

(*Continued from page* 362.)

3. "June 2d, 1860. Dr. S. and myself summoned to an adjoining county to see Wilson Shaw, a young man 20 years of age, said to have had 'a gun barrel blown completely through his head.' * * * Found accident had occurred twenty-four hours before as the result of firing a musket of the Tower pattern (flint-lock, converted,) known to have been loaded for upwards of a year. He had been knocked down by the force of the blow, but immediately recovered and walked unaided to the house, thirty rods away. There was not, neither had there been, any loss of consciousness, nor any evidences of paralysis. His senses were naturally acute; he made no complaint, and denied suffering further than that his head felt a 'trifle sore' and the 'left eye painful;' as his sole anxiety was that some portion of the gun barrel, which he declared was buried within and 'at about the middle of the head,' should be removed.

"On displacing the bandage we found the left eye slightly protuberant, the surrounding tissues bruised and ecchymosed, and the forehead generally burned and blackened with powder. To the left of the median line appeared a large, irregular, somewhat triangular shaped opening, a trifle more than two inches in extreme length, and about fifteen lines in breadth, the upper portion tapering to an obtuse point; the narrow base of the triangle corresponded to the inner half of the supercilliary ridge of the same side. From this opening disintegrated cerebral substance was oozing, the man having already lost, according to the testimony of attendants, 'not less than six or eight tablespoonfuls, heaping full.'

"On examination was found the tip of a screw just within the skull, the body extending deep into the brain, and an attempt to move further revealed its connection with some other substance farther back. Introducing a finger, it was found to pass through a solid iron block slightly larger than the little finger, and at right angles, forming a 'T.' This second piece was discovered to lie in a slanting direction from below upward and backward—the lower portion hooked behind the posterior edge of the roof of the left orbit and the lesser wing of the sphenoid, in the middle fossa of the base of the skull, its point projecting into the sphenoidal fissure pressing upon the nerves and tissues at the posterior portion of said orbit; hence the protrusion of the eyeball, and the pain complained of when traction was made upon the screw; the other, or superior end, extended to the vertex, being firmly *jammed* upon the under side of the skull immediately to the left of the *falx*. It was now understood why an attempt made to lift the lower arm from behind the lesser wing of the sphenoid, by employing the screw as a lever, was futile.

"The next indication was to push the screw upward and backward in order to tilt the upper arm of the larger solid backward and downward, and thus secure room to lift the whole from behind the sphenoidal wing by a like movement; but this, too, was a failure, since the skull at the upper edge of the wound refused to allow the point of the screw to pass.

"After a vain attempt to shorten the screw with such ap-

pliances as were at hand, a portion of the skull was excised (sufficient to permit its point to pass within the cranial cavity), when the mass was lifted and removed from its bed, and proved to be the breech-pin of the gun, a solid mass of iron of above *five ounces weight.* It was *three-and-one-fourth* inches long, and *five-eighths* broad by *one-fourth* thick along its flattened portion, except the breech screw-head, which was *five-eighths* in diameter by *three-fourths* long. The screw which passed through this at right angles was *two-and-seven-eighths* long, and was bent at the point where it passed through the pin, wedging it tightly, preventing it being pushed backward and through the breech by this bend; it also stood at an angle of thirty degrees, with its point leaning toward the breech-screw head, the portion that lay against the vertex.*

"In seeking other foreign bodies fully a teacupful of disintegrated brain was removed. At the depth of *four-and-one-half* inches, actual measurement, two pieces of bone, each something more than half an inch square, were found imbedded in the left posterior lobe of the cerebrum; several smaller fragments and numerous crumbs were also removed.† * * * Then, after gently scraping the torn and bruised walls of the cavity, and cleansing the edges and surfaces of the membranes, a plug of oiled lint was introduced and secured by adhesive straps and bandage."

Subsequent details are of little moment. *Hernia-cerebri*, the bugbear of authors, supervened, but was freely excised with the knife, and the patient was discharged five weeks from the date of

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* In all, the bulk of brain lost could not have been far frem seven or eight ounces by measure—fully the latter figure if the estimate of attendants may be relied upon!

† I omit the experiments made to determine the sensitiveness of the cerebrum. Suffice it to say Shaw readily estimated the character, quantity, temperature, feeling and position of everything introduced within the brain. A pair of surgical scissors he declared felt like "smooth iron or steel," and that the points were the "least bit higher and just between my ears. But the brain was without tenderness. While standing by and watching Dr. Willson, who was conducting these experiments, I expressed surprise at the accuracy of sensation, whereupon Shaw laughed and said: "Why, I can feel anything in there just as plainly as at any other portion of my body!"

injury. Before, he had been a farm boy, but he now blossomed out as a school teacher, and subsequently as phrenological lecturer, temperance orator, Justice of Peace, map agent, labor agitator, and saloon keeper. He recently died in Grand Rapids, Michigan, from the effects of chronic alcoholism, and the only marked mental aberration ever manifested was a decided disinclination to pay his lawful debts, including the extremely moderate bill of the attending surgeons.

4. In July, 1872, I was personally called to see a Norwegian with a transverse cut across the head and through the brain, extending from one and one-eighth inch above, and one and a fourth inch anterior to, the left ear, to a point precisely opposite the tip of the right auricle. The cut was made by a band saw bolted to the circumference of a horizontally moving circular plane twenty-seven feet in diameter, the general appearance and application being that of an enormous *trephine*. The wound was nearly eight inches in length, following the contour of the head, and seven-eighths broad, scalp and brain being excessively lacerated. Above two ounces of disintegrated cerebral substance was removed. The case was very like those already narrated, and similarly treated, recovery being complete. Once, suspicious symptoms presenting, the lower edge of the wound was freely incised, penetratieg the cerebral tissue to the depth of an inch or more, and followed by free evacuation of pus. Seven months later the patient succumbed to the effects of an alcoholic debauch, and a post mortem revealed the brain perfectly healed, normal, and without any evidence of disease.

5. This, reported by Doctor Folsom of California, was a wound made by a saw running longitudinally, and extended from a point on the frontal bone one-and-one-half inches above the nose, to a little to the left and below the occipital protuberance. In its course it divided the superior edge of the left parietal. Nine inches in length by one in breadth, the depth varied from two-and-a-half to three inches. Recovery was perfect, with no impairment of mental faculties.

6. September 9, 1881—By an explosion in a flouring mill a stick seven-eighths square and seven inches long was driven into

the brain of a lad nine years of age; it entered as did the tamping iron in the case of Gage, with nearly the same direction, yet failed to reach the vertex. Removal was accomplished with some difficulty, and followed by a discharge of cerebral matter—half an ounce or more. By keeping the wound freely open for five weeks a good recovery was made, though at one time, owing to neglect on the part of parents, the track was allowed to become blocked, and an attack of encephalitis followed, quickly yielding when free exit was secured for pus.

7. Newfoundland dog, four years of age, was wounded by the premature discharge of a gun, the missile being an SSG *green cartridge* (swan shot packed in bonedust in copper wire cage, which goes sixty yards or more as a solid ere the pellets are dissipated)! ploughing a groove three fingers deep and two broad in the anterior portion of the head. For the sake of experiment the unfortunate's life was spared, and with prompt and careful attention wholly recovered, the cerebral portion of the wound healing by granulation; exuberant granular points were touched daily with nitrate of silver, and the entire tract dressed with surgical oakum, maintained in position by a hood. This occurred two years since. The creature yet lives and appears in no way different from other canines of his age and class, and is in considerable repute as a sire. A like incident occurred to a valuable brood mare belonging to a neighboring practitioner, but I have been unable to secure particulars. According to the owner's statement the loss of cerebral substance was considerable, and the vision of the right eye destroyed. Since, she has given birth to three foals, has been worked upon a farm, and on rare occasions driven upon the road.

(*To be continued.*)

An Interesting Meeting.—Prof Law and Dr. Salmon of Washington and Dr. Frank S. Billings of Nebraska have been invited to address the swine breeders at the sixth annual meeting of the National Swine Breeders' Association, to be held in Chicago on the 16th inst., at 10 o.clock a. m. at the Sherman House.

PHYSIOLOGICAL PATHOLOGY.

UPON THE VARIABLE DURATIONS OF THE DEVELOPMENT OF TUBERCULOUS.

By M. G. Darenberg.

Pure cultures of tuberculosis bacilli, prepared by the process of Nocard and Roux, kept at 38° and inoculated in rabbits by trephining, kills them in from 21 to 30 days, with the ordinary symptoms of human tuberculous meningitis, such as hemiplegia, blindness, deafness, etc. The thickened meninges are infiltrated with pus full of bacilli, which are also found in the liver, without other microscopic lesions. Guinea pigs inoculated by trephining, die in 20 to 50 days with bacilli in the liver and the spleen, but almost always without microscopic lesions. These same cultures inoculated per cranium to hens or pigeons kill them in six or seven months, with the lesions of tuberculous meningitis.

A pure culture of tuberculous bacilli, kept at 15°, after complete development, inoculated by trephining to a very strong rabbit, has produced a cold abscess on the summit of the cranium, which made its appearance ten months after the inoculation. The animal lived in perfect health with that abscess four and a half months and was afterwards killed. The pus on the walls of the abscess, which was as large as a pigeon's egg, contained bacilli, but the other organs contained none. Guinea pigs and rabbits two and three months old, inoculated with pus taken from this animal during life, died with tuberculosis in from twenty-four to thirty days, while large rabbits, inoculated with the same pus, did not, four months after, present any morbid symptoms. This fact seems to confirm the experiments of Arloing, who has seen scrofula produce tuberculosis in young but not in adult rabbits.

The marrow of animals dying with tuberculous disease contains a few bacilli. We have seen marrow which had been dried twelve days before with chloride of lime, kill a guinea pig in 140 days, with tuberculosis of the spleen, liver and omentum. A portion of marrow which had been dried nineteen days killed a guinea pig in 200 days with pulmonary tuberculosis.

These facts prove that the duration of the evolution of tuberculosis depends on the species and the age of the animal, and also on the degree of vitality and of the quantity of the tuberculosis virus injected.—*Academie des Sciences.*

SOCIETY MEETINGS.

NATIONAL VETERINARY AND SANITARY ASSOCIATION,

This Association was in session at the Coates House at Kansas City, Mo., Oct. 31st and Nov. 1st and 2d. Dr. Jas. Hopkins, 1st Vice-President, was in the chair, in lieu of President J. L. Brush, of Colorado, who was absent.

Members and parties present were: Hon. Norman J. Colman, Commissioner of Agriculture of the United States, Washington, D.C.; Dr. D. E. Salmon, Chief of the Bureau of Animal Industry; Dr. J. D. Hopkins, Territorial Veterinarian of Wyoming; Dr. Paul Paquin, State Veterinarian of Missouri; Dr. A. A. Holcomb, State Veterinarian of Kansas; Dr. Julius Gerth, Jr., State Veterinarian of Nebraska; Dr. A. J. Chandler, Territorial Veterinarian of Arizona; Dr. Holloway, Territorial Veterinarian of Montana; Dr. M. Stalker, State Veterinarian of Iowa; Dr. W. Williams, Assistant State Veterinarian of Illinois; Prof. Morrow, University of Illinois; Dr. T. E. White, Sedalia, Mo.; Mr. S. Hinds, President Sanitary Commission of Michigan; Mr. Woodburn, Sanitary Commissioner of Mich.; Dr. H. B. Adair, Society Against Cruelty to Animals, Kansas City; Dr. Gadsden, Philadelphia, Pa.; Dr. F. Allen, Emporia, Kans.; Dr. M. D. Lewis, Rockport, Mo.; A. S. Mercer, Editor *Northwestera Live Stock Journal*, Wyoming; Mr. Pearson, Chairman Illlnois Live Stock Commission; Mr. McChesney, member Illinois Sanitary Commission; F. W. Smith, Missouri State Board of Agriculture, etc., etc.

Letters of regret from the following gentlemen who could not attend were presented by the Secretary: Dr. A. Liautard, American Veterinary College; Dr. A. H. Baker, Chicago Veterinary College; Dr. A. Smith, Ontario Veterinary College; Dr. Osler, Pennsylvania University; Dr. Zuill, Veterinary Department Pennsylvania University; Dr. Wesley Mills, of McGill College, Montreal; Dr. McIntosh, Illinois University; Dr. Comstock, New York College of Veterinary Surgeons; Dr. Atkinson, Wisconsin; Dr. Bridges, Philadelphia; Dr. Miller, Camden, N. J.; Dr. Butler, Ohio; Dr. Robinson, Virginia, and some others.

The most important business was the discussions on Contagious Pleuro-Pneumonia, Texas Fever, and Maladie du Coit, the latter being, however, but slightly touched on, on account of pressure of work.

The announcement at the Cattlemen's Convention that the Bureau of Animal Industry intended to remove, about December first, all quarantine against Cook County, Ill., on the grounds that it was entirely free from any vestige of that disease (although some cases, it appears, were found not longer ago than two or three months), brought about a great deal of discussion. Several members favored the removal of the quarantine, while many opposed it. The Territorial Vet-

erinarians unanimously declared that they could not recommend to the Governors of their respective Territories the removal of Territorial restrictions placed against Illinois, and especially Cook County, if the Bureau of Animal Industry and the Illinois Live Stock Commission removed all quarantine now in force.

Amid the discussion, Dr. Paquin, of Missouri, introduced the following resolution, which was "heartily" seconded by Dr. Alloway, of Dakota :

Resolved, That while we are well pleased to know through Commissioner Colman that pleuro-pneumonia is stamped out in Illinois, we deem it unwise to remove the restrictions from the traffic of cattle from Cook County, Ill., and respectfully suggest the necessity of keeping a corps of experts at work inspecting all cattle in Cook County ; and further, that it would be unwise to remove the quarantine from the traffic of Cook County before next spring.

Referred.

The Special Committee on Resolutions reported as follows on the above resolution :

MAJORITY REPORT—BY DR. HOLCOMB AND DR. GERTH.

" Your Committee on Resolutions would respectfully return the resolution of Dr. Paquin, with the recommendation that its further consideration be indefinitely postponed."

MINORITY REPORT—BY DR. ALLOWAY.

" Referring to the resolution regarding the quarantine regulations of Cook County, Ill., your committee reports that in view of the fact that no later than September 1st a case of pleuro-pneumonia was discovered in said county, and realizing the insidious character of the disease, together with the magnitude of the damage already done by this scourge in various parts of the Union, we are of opinion that the resolution should prevail."

Live Stock Commissioner Wilson, of Illinois, began the discussion on the adoption of the majority report. He referred to the report of Commissioner Colman, which stated that the disease had been stamped out, and that the Bureau of Animal Industry was willing to raise the quarantine on December 1st. He said the Live Stock Commissioners of Illinois were willing to raise it before that time, and that they would hold a conference with Mr. Colman while in Kansas City, and endeavor to have the quarantine raised on November 15th. " There has been no pleuro-pneumonia in Cook County for ninety days," said he, " and it is a great injustice to continue the quarantine longer."

Dr. Hopkins then left the chair and spoke at length against the raising of the quarantine, and consequently in favor of the minority report. He cited an instance where the dread disease had broken out in New York after fourteen months, and said that ninety days was not sufficient time for the continuance of the quarantine after a case had been discovered. " The Territorial delegates will not dare to return home," he said, " and say to their people that they have not done what they could to prevent this quarantine from being raised."

Mr. Pearson, of Illinois, explained how carefully the disease had been rooted out, and asked that the majority report be adopted.

Dr. Holcomb, of Kansas, said that if the Cattle Commissioners of Illinois were satisfied that the quarantine should be raised, he had no objection to offer.

Dr. Alloway, of Dakota, spoke against the majority report, and Dr. Hopkins delivered another speech in which he declared that the Chicago stock yards had been the hot-bed of pestilence to some extent.

Dr. Salmon, of Washington, wanted to know what steps would be taken should the quarantine in Cook County be raised. He thought some provision ought to be made for keeping up a surveillance over the Chicago stock yards until it was certain all germs of the disease were suppressed in Cook County. The stock yards were never infected.

Dr. Alloway, in another speech, thought that on account of the importance attaching to the matter, the removal of the quarantine should not be thought of. At any rate the quarantine should be continued until the first of next year, if it was for nothing more than to satisfy everybody and quiet their fears regarding the disease. If an outbreak occurred after the removal of the quarantine, the Association could be held partly responsible for it if it endorsed such action now.

Mr. S. S. Hinds, of Michigan Live Stock Commission, spoke against the majority report, and said that the Commissioners of Illinois laid very strong stress upon the fact that no case had been discovered siuce July 12th. The official reports stated September 10th. He thought if a line was drawn against an insidious disease, ninety days should be the least length of time for it to exist. He thought the appropriation was sufficient to maintain the quarantine a long time. It was a very difficult thing, he said, to suppress the diseases of cattle in the city. After search of an entire section for victims of the disease, a diseased cow had often been found in a cellar or a garret, and as far as he knew one might yet be discovered stowed away in an attic. If there was any haste in removing the quarantine, he would hold the Bureau of Animal Industry and the Board of Commissioners of Illinois first responsible.

Dr. Holcomb now felt, from the views expressed, that it would be prudent for the Bureau of Animal Industry to keep men in the infected territory even after the quarantine was raised. His advice to the Sanitary Board was, that since a case of pleuro-pneumonia had been found in Cook County as recently as the last part of August, it would be undue haste to remove the quarantine before spring. He thought, however, that the passage of the resolutions would be an effort to dictate to the Sanitary Board, which he believed was out of the Association's province.

Dr. Paquin said that there was no dictation in the resolution. He had presented the resolutions, but they were merely of a suggestive nature. He had visited Chicago, and thought that with Cook County in quarantine there was little danger to Missouri, as it was in a position to more closely follow the work done against the disease; yet he could not feel entirely safe.

Dr. Hopkins, of Wyoming, apologized for taking the floor again, and said that the resolution had brought about the discussion and consideration it contemplated, so that, though he was in favor of it, he would not urge its passage any longer, since its beneficial effects were apparent. It appeared to him that by raising the quarantine the people of Illinois did not take the same chances that the people of the Western plains did. It had been said that the disease was confined to the cow traffic of the city. Where the disease had existed in Philadelphia and other places, it extended into the country about them. If the quarantine was removed from Chicago, it might extend into other counties of Illinois. From one of those counties one of the cattle might get into the plains. There the animals have no yards or stables to confine them, and no bounds can be put to

the disease. As long as the diseased cattle remained in fields and ranges, it could be stamped out in places, but on the plains it could not be controlled without immense cost. The quarantine should be considered in every phase. The Commissioners of Illinois had used every effort to stamp out the disease, but, on account of the responsibility of the West in the matter, the quarantine ought not to be removed. The object of the Association's meeting was to exchange ideas and discuss the matters thoroughly, and to reap benefits thereby.

Dr. Gerth here rose and seconded the motion of Dr. Holcomb to adopt the majority report against the adoption of the resolutions.

The majority report was adopted.

Notwithstanding the adoption of this report, it was evident that the discussion on that resolution produced the desired effect, as Dr. Hopkins remarked, and that the Bureau of Animal Industry and the State of Illinois will favor quarantine longer than they said at first.

Dr. Hopkins, on opening the discussion on Texas fever, said that careless handling of Texas cattle by the Chicago, St. Louis and Kansas City stock yards, had resulted in great mortality. The disease, he said, was native not only to Texas, but along the seaboard even to Virginia. He thought "Southern fever" was the best name for the disease.

Dr. Holcomb claimed that the Kansas City stock yards had caused no serious outbreak.

Dr. Hopkins said that he had not said the cattle had intermingled here, but that a lot of cattle which passed through the Kansas City stock yards had caused an outbreak of the disease in Nebraska.

Dr. Holcomb went on to say that there wasn't an animal which came into the Kansas City stock yards from the South that the Inspector didn't see, and when these cattle were inspected and found dangerous they were put in the Kansas City stock yards quarantine pen. When these cattle were purchased the purchaser was aware that they were dangerous, and he might have imposed upon somebody else.

Dr. Gerth, of Nebraska, said that upon investigation it was found that six or seven Southern cattle had been found in the herd of cattle which had been certified to as domestic by the stock yards.

This statement created quite a breeze, but was vehemently denied by Dr. Holcomb. He said that no certificates are issued on application that a herd consists of domestic cattle unless they were such. They might have been changed afterwards. The stock yards at this place, or any other, could not afford to issue a bill of health on any lot of cattle.

Dr. Paquin said that during the past year 90 per cent. of Texas fever in the State had come from the East and West St. Louis stock yards or direct Southern transportation, and only 10 per cent. from Kansas City. This was a wonderful improvement over the two years preceding. During the year he had very few cases to attend to which came from Kansas City. He thought the Kansas City stock yards had done a great deal of good toward restricting the disease. The infectious Southern cattle, he said, were driven over the bridge through St. Louis and out on the grazing grounds where dairy cattle are kept. There were no sufficient regulations to prevent this in the city of St. Louis.

Dr. Holcomb said that in 1884 the State of Kansas lost $400,000 from Texas fever. After the present law to restrict the disease was passed in the spring of 1885, not more than $20,000 has been lost any year. The arrangements of the Kansas City stock yards were such that none of the Southern cattle were allowed to go into pens used by domestic cattle. The stock yards had no jurisdiction over Missouri. They could not prevent any one from buying diseased cattle, knowing them to be diseased, and taking them into Missouri, Nebraska, or anywhere else. No certificate, he said, was issued on any cattle which came from a section south of the thirty-seventh parallel unless everything was known about them.

Dr. Hopkins—How did the outbreak in Kansas in 1885 occur ?

Dr. Holcomb—From direct transportation from the South ; not from the Kansas City stock yards.

Mr. Hoppin, of Chicago, said that in the Chicago stock yards the Southern and domestic cattle were kept entirely separate. Where the St. Paul and Northwestern unloaded, called Section D, in the stock yards, no Texas cattle were allowed at all. Mr. Hoppin said that he was in the commission business, and by buying from the Northwestern section of the yards he had never sustained any loss. Only a quarter of the yard, he said, was entirely free to the Northern cattle. It was a matter of necessity, however, to buy all over the yard, and of course risks had to be taken. At the time Texas fever occurs is generally when not many stock cattle are sold.

On November 3d the sanitarians, who were all by virtue of their office delegates to the Cattlemen's Convention, enjoyed a ride around Kansas City in carriages provided by the Consolidated Cattle Growers' Association, and visited the Stock Yards, the Fat Stock Show, Armour's Packing House, the Exposition, etc. and in the evening some attended various entertainments at the theatres, occupying reserved seats, secured also by the courtesy of those gentlemen.

Altogether the meeting was very enjoyable and profitable. The members present only regretted the absence of their Eastern brethren, whom they trust they shall meet next year.

The officers for the ensuing year are :

President—Dr. A. A. Holcombe, Kansas.

First Vice-President—Dr. Jas. Hopkins (re-elected), Wyoming.

Second Vice-President—Dr. J. C. Alloway, Dakota.

Secretary—Dr. Paul Paquin (re-elected), Missouri.

Assistant Secretary—Dr. Hollaway, Montana.

Adjourned *sine die.*

Note.—It is evident that this Association of only a few years of age is becoming recognized as useful and influential by those interested in live stock. It has been the means of improvements in sanitary regulations, and has done its share towards bringing about (in the West, at least) more beneficial sanitary laws. In the future we should endeavor to give more time to papers on contagious diseases. It is unfortunate that at this meeting the necessarily long and animated discussions on contagious pleuro-pneumonia crowded out a very valuable paper on "Maladie du Coit," written by Dr. Williams, who attended to the outbreak of that disease in De Witt County, Ill. P. P.

CORRESPONDENCE.

ANTHRAX OR TEXAS FEVER.

STATE UNIVERSITY,
COLUMBIA, MO., NOV. 10, 1887.

Editor American Veterinary Review:

DEAR SIR.—Dr. J. Dutcliffe, V. S. of Middletown, New Jersey, asks the readers of the REVIEW to throw light if possible on the cases of anthrax in which he found bloody urine, softened and enlarged spleen, dark kidneys, etc. May I suggest that perhaps these cases were the so-called "Texas fever." The symptoms that the Dr. describes are present in this malady, and characteristic features of it.

I send you to-day an extract of my last quarterly report as State Veterinarian of Missouri. You will find "Texas fever" extensively described in that little pamphlet. It was not written for the profession and is not perhaps entitled to any space in a scientific professional journal. Yet there may be something in it to throw a slight ray of light on Dr. Dutcliffe's cases, and others of similar nature.

Your obedient servant,

PAUL PAQUIN.

ETHICAL INQUIRY.

Editor Review:

I would like to inquire through your columns whether the Board of Examiners of the Ontario Veterinary College ever created a fellowship, or if they have authority to confer that degree, and if so, on how many persons have they conferred that honor?

Respectfully, ETHICS.

OBITUARY.

DR. R. P. BLAKELY, who had been for a number of years practising in the northern part of New York State, died some four weeks ago, after a long illness. He graduated at the American Veterinary College, in the Class of 1876.

CORRECTIONS.

Our friend and worthy correspondent Dr. G. Archie Stockwell calls our attention to a number of errors which have found their way into the publication of his article on Comparative Lessons of Brain Wounds, and asks us to correct them.

Page 306, for "naucrede" read *Nancrede.*
" 307, eighth line from top, for "also succeeded" read *has succeeded.*
" 358, in title, for "lesions" read *lessons.*
" 358, fourth line, for "occurred," read *accrued.*
" 358, ninth line, for "festiche" read *fetich.*
" 360, "for compression" read *of compression.*
" 361, twelfth line from bottom, for "just began" read *began just.*

NEWS AND SUNDRIES.

Testimonial to Prof. Walley of Dick Veterinary College.—A testimonial was presented to Principal Walley from the 127 alumni of the college as an appreciation of the confidence they had in the gentleman as a teacher, and of the sympathy they had with him in the recent difficulty existing between the Dick College and the College of Veterinary Surgeons of London.

Danger from Glanders.—It is stated in the *New England Farmer*, Boston, that "two men have lost their lives, one in Massachusetts, the other in Connecticut, during the present year from the loathsome disease known as glanders. In both cases the disease was contracted while the men were attempting to cure the horses by treatment." And the comment is added that "the sooner horse men learn that this disease is incurable, aud that a glandered horse is an unsafe animal to have around, the sooner the newspapers will cease to record of loss of human life from treating or handling such horses".—*Nat. Live Stock Jour.*

Prof. McCall on Inoculation of Pleuro-Pneumonia.—Unfortunately the same holds equally good with the inoculated animal, if it should have contracted the seeds of the disease by the natural method prior to or at the time of its inoculation, and as

inoculation is scarcely ever practiced until the disease has declared itself present in a member of the herd by the natural method, and consequently must have been present there for some weeks, the chances are that several animals are affected in every herd before recource is had to inoculation. Therein lies the danger, and no doubt is the sole reason, that inoculated animals have been so frequently known to propagate pleuro among sound animals. No doubt, if great care be exercised in selecting the subjects for inoculation, and if none but non-infected animals be inoculated, the contagium cannot be spread by them; but he is a bold man who would declare that after he had exercised all his skill he could not be mistaken, and that he had not inoculated any animal who had contracted the disease by the natural method. The man is not born who can discriminate with accuracy in this matter, and I repeat therein lies the, I might almost say, sole objection to the practice of inoculation for the eradication of pleuro-pneumonia, and it is an objection which will never be got over, because it is but a limited extent of the chest of the cow which is open to percussion and auscultation.

Influence of the Sire on the Color of the Offspring.—Referring to the influence of the parents in breeding, a contributor to the *Live-Stock Journal*, London, says: "As far as my observation goes, a *black* sire *always* exercises an overpowering influence upon color. I have less knowledge of horses than of any other variety of live stock; but a black bull, of any variety, almost invariably leaves black calves, let the dam's color be what it may. The only color which holds its own against the powerful black, is white. This will sometimes make the offspring of a black bull, blue or dun; but a red, or roan, or red-and-white dam accepts for its offspring nineteen times out of twenty, the black color unmixed. Does any poultry breeder or pigeon breeder find that a red cock begets from hens of any other hue, nineteen-twentieths of the produce red? Yet this is what a black bull does. Do breeders of dogs find black sires thus prepotent? Probably not, for black—which appears a natural color to cattle, and to which they are glad to revert—does not seem to be so with any dogs. I

have for some years been trying to produce poultry with regular markings of black-and-white. It seems well-nigh impossible. Yet regular markings of red-and-black are easy enough, and even of red-and-white. Regular black-and-white markings are common with several species of wild birds, and pencilled fowls are common enough. But black-and-white as domesticated rabbits, dogs, horses, cattle, sheep, having the mixture, *i. e.*, in large patches of each color, are very rare indeed with domesticated gallinæ."

THE HORSE DISEASE (?) IN MONTANA.—Dr. H. Holloway, Territorial Veterinary Surgeon, returned last Thursday evening from a professional tour through portions of Madison County. The doctor found several cases of glanders in one locality. The animals were killed, and as the cases were the outgrowth of a single case which was disposed of some time ago and were confined to a limited area, the doctor thinks he has effectually rounded up the disease in that particular locality.

Being asked by a *Journal* representative as to the nature and character of the new horse disease which is proving so fatal in several sections of the territory, the doctor replied that his opportunities for making a thorough examination of the horses afflicted with the disease has been so limited that he was not prepared to give it a name. So far as his observations extended it resembled a miasmatic fever, but in no way resembled cerebro-spinal meningitis. Microscopical examination of the blood showed an excessive amount of fibrine and a shrinkage of the red corpuseles.. A sufficient number of examinations have not been made to state if this is the case in all affected animals, but animals treated on this hypothesis did remarkably well. The disease is not by any means incurable, and although many horses that are allowed to weather the storm unassisted are left in a comparatively useless condition, there are many which have had the advantage of intelligent treatment working now as well as they ever did.

The doctor says the disease is abating. He looks upon it as one incidental to high altitudes and mountainous regions, as inquiries made of eastern veterinarians failed to bring from them a knowledge of its existence there.—*Nat. Live Stock Jou.*

American Veterinary Review,

JANUARY, 1888.

EDITORIAL.

Appeal on Behalf of the American Veterinary College Fund.—An interesting development in the history of that institution—ought to have transpired long ago—good judgment of the board of directors—the present accommodations not up to the requirements—the history of the college answers for its future—the alumni have largely contributed—the directors also—but little more needed—shall the work of building begin soon, or what?—let every one work for it. Bacteriology—Hog Cholera.—Did we commit an error in our last? In his letter Dr. E. Salmon says we did. Animal Origin of Contagious Diseases.—An important subject of inquiry—scarlet fever investigated—Dr. Klein's—Dr. Strickler of N. J.—the importance of his experiments—can his conclusions be all accepted?—we begin the publication of his long paper—our principal objections to one of his suggestions. Ethical Inquiry—Supposing the Ontario Veterinary College should issue fellowship, what of it?—its circular says nothing about it. Honorary Title.—Our answer to the inquiry. Crowded Pages.

Appeal on Behalf of the American Veterinary College Building Fund.—A pamphlet received from the Board of Directors of the American Veterinary College, which we copy in another place, relates to a subject which should strongly commend itself to the attention of veterinarians at large, and especially to the alumni of the institution from which it emanates, and who more than others, should feel a special interest in the matter. It is entitled, "*An appeal to the People of the City and State of New York on behalf of the American Veterinary College Building Fund.*"

Our object in reproducing this pamphlet is that it may accompany our emphatic and hearty endorsement of the recommendation

which it conveys, and to refer briefly to the record of the institution in question, in respect to the good work it has accomplished in the past, and to the guarantee which such a record must offer of a larger and better performance in the future. With improved facilities and increased appliances, who can doubt that what has been already effected by the persistent energy and strong will of its officers, without extraneous assistance, will, with new means at their command, be largely augmented and emphasized, and that the American Veterinary College will amply vindicate its claim to the title of the true *Alma Mater* of veterinary science in America?

This movement of the Directors is well judged and wisely executed, and any possibility of failure of success should be contemplated only with regret and mortification. Indeed, it is to be feared that such a failure might even involve the permanent existence of the College; and who can anticipate the possibility of such a catastrophe with patience and equanimity?

The accommodations, the facilities, the capacity and the will for the performance of the peculiar work of such an institution have been put to the extremest tests, and have never been found lacking or inadequate, and no one can successfully dispute the title of the College to that recognition which is now solicited by its officers as its rightful claim. It is obviously something more than a pretension put forth by a mere association of private individuals, or a mere personal solicitation for aid in a self-seeking enterprise.

Only a comparatively small amount of money will now be required for the purpose contemplated. Some of the alumni of the college, with the aid of generous friends, have already contributed largely towards the end in view, and several thousands of dollars have been subscribed by the Board of Directors. But little more will be necessary to raise the figures to an amount sufficient to enable them to proceed in the work of breaking ground on the site which has already been secured, and which is now the property of the college.

Shall the progress which has been hitherto accomplished become only a reminiscence of so much wasted energy, or shall the

coming year witness the opening of the new building in New York, destined to form the home of an institution which to this day has provided veterinarians to every scientific institution in the country where the services of accomplished teachers and practitioners has been demanded? Every friend of veterinary medicine in the United States will watch the result of this appeal with interest, and we are sure will not be likely to do so without also remembering the admonition of Hercules in the fable, and putting his own shoulder to the wheel.

Bacteriology—Hog Cholera.—In our allusions in the editorial department of last month's Review, to the work of Professor Billings and Dr. Salmon, in their investigations of the nature of hog cholera, we took occasion, in referring to their respective claims to priority in the discoveries which have been hitherto made—possibly from a somewhat careless interpretation or misreading of the published statements—to accord the credit of precedence to Dr. Billings.

Dr. E. Salmon, very properly looking after what he considers to be the justice of his own claims in the premises, replies to our remarks in a long letter of vindication, which is of course entitled to a place in our columns, and which we print below. This the text of the letter:

U. S. Department of Agriculture,
Bureau of Animal Industry,
Washington, D. C., Nov. 19, 1887.

Editor of American Veterinary Review:

Dear Sir.—In your editorial in the November number of the Review I find a sentence which certainly calls for a protest on my part. Referring to the investigations of hog cholera, you say, so far as you have been able to gather from the writings of Dr. Billings, that he and the writer have "quite failed to agree upon the point of the true origin of that disease; if indeed, their disagreement be not rather on the question of priority of discovery. Dr. Billings, while giving due credit to Dr. Detmers, who from lack of proper instruments was unable to positively realize the nature of his discovery, claims for himself, and we believe rightly, and to his researches, the position of first discoverer."

In this sentence you refer, as I understand it, to priority in the discovery of the bacterium of hog cholera. If I am correct in this, I can only express my astonishment that one who has followed those investigations as closely as the talented editor of the Review should be led, by the writings mentioned, to express such an opinion.

In reference to Dr. Detmers, it is incontestible that he had instruments sufficient to determine the microscopical characters of any microbe he discovered.

The statement that he worked entirely with water immersion lenses, is not correct. He had the one-tenth and one-fifteenth objectives of Tolles and the one-eighteenth of Zeiss, all homogenous immersion, which are as good as any lenses now in use. (See article in *American Naturalist*, 1882, pages 199 and 200). He described a motile germ, which excludes the micrococcus of swine plague. His germ existed in the form of a sphere or of two spheres united; hence he called it bi-spherical. This certainly is not the germ of hog cholera. No one could say this more distinctly than Dr. Billings in his letter on Texas fever (page 336, REVIEW for November), where he speaks of a germ which he says cannot be differentiated under the microscope from the hog cholera germ. He says: "*The germ is not a diplococcus; it has not a figure* 8 *form.*" If anything more were necessary to disprove this nonsense as to Dr. Detmers' claims to priority, it may be found in the last report of the Ohio State Agricultural Experiment Station, where that gentleman speaks of having received a culture of the bacterium described in my reports of 1885 and 1886, and states that it is not the same germ which he regarded as the cause of hog cholera. Now, if you will turn to page 212 of the Report of the Bureau of Animal Industry for 1885, you will find a very full description of the bacterium of hog cholera, which was written and published before Dr. Billings began his investigations of this disease. With this before you I do not see how you can give him credit for priority of discovery, whatever else you may see in his work and writings.

If you have read the screeds which Dr. Billings has published in the daily newspapers of Nebraska by the page, in regard to the investigations of hog cholera, you must understand why I have paid no attention to them. I think you will agree with me, that the most charitable explanation of the language used in his writings is, that they are the product of a disordered brain. If the editorials of the REVIEW are based upon such literature, however, I must occasionally interpose with a mild objection, when my work is questioned. I will simply add that so far as I have been able to gather from Dr. Billings' extremely diffuse and bombastic writings, he has made very few experiments and has proved nothing that was not previously recorded from the results of experiments in this Bureau. When he differs from our conclusions, he is either plainly wrong or without any basis of fact. The motile germ of hog cholera is not identical with the non-motile germ which causes the German schweineseuche, as Billings thinks; and I venture to assert, it would not be mistaken for it by any one even tolerably well acquainted with the different species of micro-organisms. Not only is there the fundamental difference that one moves rapidly in liquids, while the other is incapable of motion, but they have a very different appearance under the microscope; they stain differently, and produce very different lesions when inoculated upon animals.

I have not the time to point out the details of these differences, but I mail you a copy of the Report of the Department of Agriculture for 1886, in which you will find, from pages 603 to 684, a very clear statement of the facts. I would refer you particularly to pages 674, 681 (last paragraph), 682 and 683. I am sorry to say that the Report of the Bureau of Animal Industry for 1886 has not yet been received from the Government Printing Office, and consequently I have not been able to send it to you.

Very respectfully, D. E. SALMON.

Animal Origin of Contagious Diseases of Mankind.—The question of the origin of certain diseases of the human constitution which appear to be derived from related affections in the lower animals, has for the last few years occupied the attention of both physicians and veterinarians, and the publication of much valuable literature has at various times given evidence of the interest of the subject, and shown the results of the minute observations and important discoveries which have rewarded the investigations of the students and scholars whose researches have tended in this direction.

Of the diseases of this class which have attracted the largest amount of attention on both sides of the Atlantic, probably none has excited a more wide-spread interest or become the subject of more careful and earnest study than scarlatina.

Numerous observations and experiments have been made in this direction in England, notably by Dr. Klein, which, though not admitted as conclusive, and even controverted by other English authorities, are all familiar to veterinarians. The reports published by Dr. J. Strickler, some years ago, on the same subject, are also strong evidences of the interest which the subject has excited on our own continent; and a paper read by that gentleman at a recent meeting of the Academy of Medicine in New York, on "Foot-and-mouth disease, and its relation to human scarlatina as a prophylactic," is of so interesting a character that we are induced to reproduce it in the columns of the Review, and accordingly begin to reprint it in our present number, in which it is copied from the *Medical Record*. It will doubtless be read with interest, and while we cannot adopt the conclusions to which the author seems to have been led by the experiments reported, we are constrained to accord to the Doctor great credit for the labor he has undertaken, and, so far, accomplished.

To one point, and one which involves considerations of great importance, we feel compelled, with Professor Law, who participated in the discussion of the paper, to interpose, as sanitary veterinarians, a most decided objection. It is, that if foot-and-mouth disease virus is necessary to decide its prophylactic effect against scarlet fever, it is better that the experiments should be instituted

abroad than in this country. The wide-spread prevalence of that disease in America amongst our ruminants would be a too serious danger to our national wealth.

Ethical Inquiry.—A question was propounded to us, under this title, in our last number, to which, hoping to receive certain information from the institution directly interested in the matter, we failed to make a reply.

We regret to be compelled to say that we are at the present time still unable to satisfy our inquisitor. Whether the Board of Examiners of the Ontario Veterinary College have or have not created Fellowships, can only be answered by the gentlemen who constitute that board. By what authority such degrees as have been referred to are conferred, we are uninformed, though we conceive that with an organization such as is possessed by that institution, as a private and independent establishment, there can be no existing authority with power to prevent its conductors from determining their own course. And if they see fit to do as they have done, what then? What of it? As to how many persons have received the degree in question, we have no knowledge.

A careful reading of the last announcement and circular of the Ontario Veterinary College fails to throw any light on the question presented to us by "Ethics."

Honorary Title.—We have received the following inquiry:—

Dear Sir: *Will you please state, through the columns of the* Review, *the meaning of "Honorary Graduate of a College."* *Respectfully,* Subscriber.

Honorary degrees, as we understand the matter, are titles awarded to professors in universities, or to medical or other professional magnates, in acknowledgment of or as rewards for the service they may have rendered to the cause of science in the pursuit of their special labors and the performance of their special duties. *Colleges*, in the true sense of the term—that is, as mere educational establishments—seldom, if ever, grant such a degree; and when it is bestowed, we believe it is only upon those

who have been previously graduated by an institution where a similar educational course obtains, and then it is considered not as a *graduating* document, but as one of membership merely. As far as veterinary honorary degrees of this nature are concerned, we know of but one institution which may be considered as having granted them, viz.: the Royal College of Veterinary Surgeons in England; and certainly in this case the title is not one of *graduation*, as implied in the inquiry, but of fellowship only to persons already graduates of veterinary medicine.

Crowded Pages.—The preoccupation of our pages in the present number excludes several articles of importance and interest, which we would have liked to include in our table of contents for the current month. These will receive justice in our February number. Among them, a communication from Dr. Gadsden and an offer made by the Patho-Biological Laboratory of Nebraska, are matters of too much importance to be passed over with merely a single notice.

ORIGINAL ARTICLES.

APPEAL

TO THE PEOPLE OF THE CITY AND STATE OF NEW YORK IN BEHALF OF THE AMERICAN VETERINARY COLLEGE BUILDING FUND.

The millions upon millions of domestic animals in the United States represent an aggregate wealth of upwards of $2,500,000,000, in addition to their being to us sources of food, labor, raiment, pleasure and products for exportation.

These animals are subject to disease and injury. The older nationalities of Europe have for the past century had established, under government support, large and thoroughly appointed educational institutions for the qualifying of men, by medical training, to care for the domestic animals, when sick or injured; to guard against the importation of contagious diseases; and to arrest such diseases by intelligent and scientific methods of procedure when they do occur. More than that, the special medical

knowledge of educated veterinarians enables them to protect men from diseases communicable from animals, by the prompt recognition of such diseases in the latter.

In European countries the veterinary profession constitutes bodies of educated, scientific and respected professional men, whose fulfilled duties are a bulwark of protection to the State, a safeguard to the citizen, and a boon to suffering animals.

In 1875 the American Veterinary College was chartered and organized for the purpose of qualifying men, by a special medical education, for the practice of veterinary medicine, and, as stated by the *New York Herald*, in an editorial article of March 25, 1887, "it has fought its way to national reputation without public endorsement."

Twenty years ago an American veterinary profession did not exist; to-day, its successful national representatives are, in the main, alumni of the American Veterinary College.

The evidence of the work accomplished by the College in the past twelve years is shown by the fact that out of not more than 600 veterinary surgeons qualified to practice, and holding diplomas as such, who are to-day practicing veterinary medicine in the United States, the American Veterinary College has contributed 236, or more than one-third.

As to the efficiency of the alumni of the American Veterinary College, it may be stated that out of her 236 alumni, *fifty* of them have been or are now occupying Government or State positions or filling professorships in agricultural and veterinary institutions.

The Hospital Department of the College has within the past twelve years treated, in the presence of the students of the College, 26,800 sick animals, horses and dogs, and over 8,800 operations have been performed.

Free clinics have been held since 1875, to afford the poor, who cannot remunerate the services of a veterinary surgeon, an opportunity to obtain relief for their suffering animals. At these clinics, held twice a week throughout the year, there have been treated during the past twelve years over 5,000 sick animals, upon whom over 1,300 operations have been performed.

In the Hospital, patients are admitted for care and treatment during their illness, thereby affording the best possible opportunities for the instruction of the students of the College. During the past twelve years over 5,500 horses and 600 dogs have been inmates of the hospital.

All this collegiate and hospital work has been quietly carried forward in our midst by the trustees and faculty of the American Veterinary College, and by it, as justly stated in the *New York Herald* editorial before quoted, "New York, the birthplace of veterinary medicine, veterinary societies and veterinary journalism in the United States, has a school which has sent forth hundreds of able practitioners, and made an enviable name for itself without any assistance from the public."

The work of the American Veterinary College and the success of her alumni as professional men, have naturally drawn attention to the subject of veterinary medicine. The University of Pennsylvania and Harvard University have each established a Veterinary Department. Of the former the *New York Herald* says: "The success of the American Veterinary College has stimulated educational work of a similar kind in other parts of the Union. A veterinary school was started in Philadelphia three or four years ago, and it has made rapid progress, because the people have been generous towards it. The city of Philadelphia gave it twenty lots of ground; the sum of fifty thousand dollars was raised, and it is just about receiving one hundred thousand dollars from the State.* If we are to keep ahead of Pennsylvania in veterinary education, the people will have to put their hands in their pockets. The city which gives shelter to Maud S., for whom one hundred thousand dollars has been refused, and to thousands of horses of many degrees of value, should not hesitate to subscribe one hundred thousand dollars for the better equipment of a college which year after year is fitting men to guard our flocks and herds from the ravages of disease."

The present accommodations of the American Veterinary College and Hospital are now totally inadequate to meet the de-

* The Pennsylvania Legislature gave $50,000 at their last session to the Veterinary Department of the Pennsylvania University. The appropriation, however, was vetoed by the Governor of that State.

mands upon them. From a class of 12 students during the session of 1875–'76, there were 134 in attendance during 1886-'87. The college class-rooms were so crowded as to be uncomfortable, and the hospital is obliged to send away patients for want of room.

The College has an efficient and experienced faculty, with a body of 236 alumni in the field of professional work, in thirty States and Territories of the Union, *but what is wanted is a suitable building, worthy of the City of New York and the past record of the College, to enable the institution to do its full measure of good and useful work.*

Steps have already been taken toward the accomplishment of this end, viz.:

1st. The Trustees of the College have obtained from the Legislature of the State of New York (session of 1887), specific authority to hold property to the amount of $150,000, "by purchase or devise."

2d. Through the personal contributions of some of the alumni of the College and their friends, the College has obtained title to two lots of ground (50 x 100 feet) in West 64th Street, between Eighth Avenue and the Boulevard, upon terms that can be met by the present income of tha College.

3d. At the last meeting of the Board of Trustees of the College, the following resolution was adopted:

"*Resolved*, That the Committee appointed at the special meeting of May 5, 1887, be and are hereby authorized and empowered to solicit donations to aid in the purchase of real property in the city of New York, and for the erection of suitable buildings for the use of the College; and if it shall appear to said committee impracticable to obtain donations to a sufficient amount for the purpose expressed, that then said committee be and hereby are authorized and empowered to solicit and obtain subscription monies for said purpose, to be repaid at such times, and bearing such rate of interest, and on such terms as said committee shall deem necessary or expedient to further said project."

4th. The Committee of the Board of Trustees of the College, in pursuance of the powers given them by the above resolu-

tion, have determined to solicit donations and subscriptions to the amount of $75,000 to a fund to be known as "The American Veterinary College Building Fund:"

a. Donations from those who may feel inclined to contribute to the object set forth;

b. Subscriptions, to bear 4 per cent. interest from date of payment of the same to the College Treasurer, and redeemable from a sinking fund, to be provided for the purpose, as the Trustees may direct;

c. Donations and subscriptions will be called in, to commence building, when the same shall amount to $40,000.

Great interest and enthusiasm have been manifested in New York city, of late years, in the horse shows, dog shows, cattle shows, etc., that have been held from time to time. This does credit to our age and our generation, giving evidence of the high standard of our civilization and our Christian virtues, which hold out the hand of kindness and give thoughtful consideration to our dumb and trusty servants. To carry out in the most efficient manner this interest and enthusiasm, these lovers of the horse, the dog, the cow, etc., should contribute to the erection of a building for the American Veterinary College, with all the necessary accommodations and appointments for the thorough education of men to care for these creatures when sick or injured.

It would be unjust to the public spirit of New York State and city to believe, after what has already been accomplished by the American Veterinary College in giving to New York State and city the proud position of the *pioneer* in the cultivation of veterinary medicine in the United States and the founder of an American veterinary profession, that they would withhold their endorsement of the work already done, in not giving the means necessary to maintain and perpetuate the position already attained.

In conclusion, the Trustees of the American Veterinary College confidently appeal for donations and subscriptions to the American Veterinary College Building Fund, upon the plan and for the purpose above set forth:

1st. On behalf of the scientific education demanded for the care and protection of our vast national wealth in domestic animals, now so inadequately cared for.

2d. That our city and State may be able to maintain her already acquired national supremacy as the birthplace and centre of veterinary education of the Union.

3d. As a humanitarian movement which is to insure the care, in sickness and when injured, of our faithful, though dumb, servants and companions.

4th. In behalf of a charity which restores to the poor man his beast—often the bread-winner for his family.

FOOT-AND-MOUTH DISEASE

AS IT AFFECTS MAN AND ANIMALS, AND ITS RELATION TO HUMAN SCARLATINA AS A PROPHYLACTIC.

Also, Remarks upon the Transmission of Human Scarlatina to the Lower Animals, and the Use of Virus thus Cultivated as a Preventive Agent.

By J. W. Strickler, M.S., M.D., Orange, N. J.

The disease as it affects man.—It was long ago discovered that the human subject was susceptible to the contagium of foot-and-mouth disease. The disease is contracted in one of two ways, viz., by drinking milk obtained from cows affected with the disease, or by the accidental introduction of the virus into open wounds or sores upon the hands, or other parts of the body. In either case the systematic disturbance is, as a rule, very slight, while the local lesion, in the great majority of instances, consists of an inflammatory sore throat, with or without the development of small vesicles upon the inner surface of the cheeks, lips and tongue. The cervical lymphatic glands are generally enlarged and tender. The tongue sometimes becomes swollen to a considerable degree. In some instances there has been an eruption of vesicles upon the feet and hands, in others a scarlet eruption has made its appearance upon different parts of the body. Hertwig,* during an epidemic of foot-and-mouth disease, drank daily for four days one quart of milk taken from diseased cows. In less than forty-eight hours he "began to experience slight fever, twitchings in the limbs, headache, a sensation of dryness and heat

*Ziemssen's Cyclopædia of the Practice of Medicine, vol. iii., p. 521.

in the mouth, and an itching in the hands and fingers. These symptoms continued about five days. Then the entire mucous membrane of the mouth began to swell considerably, especially that of the tongue, upon which organ, particularly the edges of it, and also upon the inner surface of the cheeks and lips, there appeared small vesicles, never larger than a lentil, of a yellowish-white color, and filled with turbid whitish contents which were readily discharged when the vesicles were pricked, but were soon reproduced. Upon the following days the vesicles became still larger and burst; the epithelium was then detached, leaving behind dark-red erosions which gradually healed. There was, conjoined with the above symptoms, a smarting pain in the mouth upon the attempt to masticate, speak or swallow, and also an intense thirst. The vesicles upon the lips dried up, leaving in their places thin brown scurfs, which upon the tenth day after the appearance of the former fell off. Simultaneously with the development of the eruption in the mouth, numerous vesicles were formed upon the hands and fingers, which at first were of the size of a millet-seed, firm, and of a yellowish-white color, but in their further progress approximated in look to those in the mouth, healing, however, more slowly. At the termination of this process he was restored to the best of health." Two other physicians performed the same experiment upon themselves, with the same result as obtained in the case of Hertwig, except that they had no eruption of vesicles upon their hands. The symptoms thus produced by drinking fresh milk containing the contagium of the disease under consideration, vary somewhat from those produced by inoculation of the human subject with the contents of the vesicles, at least in some instances. That this is true will be shown in the record of the following cases:

About the end of August,* Mrs. X——, wife of an extensive farmer, came under my care on account of an eruption of *bright red spots*, one-eighth of an inch in diameter (covered with a thin white desquamation), which were so densely sprinkled over her body as to leave only minute interspaces of sound skin. As Mrs. X——had within the last three years suffered from hepatitis with

*Edinburgh Medical Journal, 1863, Hislop.

jaundice, I thought the eruption might be thus originated. Alterative purgatives made no impression upon the disease.

On a subsequent visit I found her husband complaining of a sore throat and mouth. Upon examination found the mucous membrane of his mouth, lips, tongue, and throat studded with small ulcers, giving off a white slough, which left behind a clean but highly sensitive cup-shaped cavity. His forehead was covered with an eruption similar to that upon the lower extremities of his wife. The eruption was never vesicular as it is in cattle. The spots made their appearance as slightly elevated, reddish prominences (papulæ), which gradually become bright red, then threw off a silvery-white scale, and gradually disappeared. Mrs. X—— had slight inflammation of the fauces. Some of the children about the house were also affected with sore throat, but the symptoms in these cases were very mild and easily overcome. At the time this disease affected the above patients the whole of Mr. X——'s cows had murrain. Mr. X——says that, when examining one of the cows which was suffering from the disease, and while in the act of pressing back the lip, he observed two or three pimples on the upper lip to burst and eject the matter to a considerable distance, and that he received a portion on his cheek and hand. Both parties, as well as those affected in a lesser degree, had gone freely about the byres, handling the diseased cows, of which there were at times upward of a dozen ill at once, and the peculiar virulence of the symptoms in Mr. X——'s case seemed to depend upon the circumstance that the matter caught upon his hand and cheek was derived from one of the worst of the diseased animals.

The epidemic of "sore throat" which occurred at Dover, England, in 1884, furnishes still greater opportunity for the study of "foot-and-mouth disease" as it affects man.* "During the early days of February, 1884, a remarkable outbreak of sore throat occurred in Dover, England, which, on account of the suddenness of the outbreak, the severity of the symptoms, and its chief prevalence among those occupying the best houses in the town, attracted no small amount of public attention, and naturally

*Quoted from the official report of the epidemic.

provoked a large amount of interest in the investigation as to the cause thereof. Controversy waxed warm, especially when it became known that the cause of the epidemic corresponded most intimately with the track of a particular milkman, and that the milk supplied by this man was believed to be the vehicle of the specific poison occasioning the epidemic. . . . . .

For the purpose of ascertaining what particular taint was present in the milk which was calculated to occasion this particular epidemic, a searching inquiry was made, and the following facts collected: The implicated dairyman obtained his supply of milk from twelve cows kept on his own premises at Dover, and also from three farm establishments in the country. All these places were visited and diligent search made for any evidence of the disease among either the cows or people living or engaged on the premises.

"At one of the establishments in the country it was found that aphthous fever had broken out among the stock on January 14th, and that milk from some of the affected cows was delivered to the Dover dairyman, and, after being mixed with other milk, distributed to his customers. Moreover, it was from this infected farm alone that the Dover dairyman obtained the supply of cream furnished to his customers. At the beginning of the inquiry it was stoutly denied that any of the milch-cows had suffered from disease, and a certificate from a veterinary surgeon and inspector to this effect was obtained and published. The matter was then referred to the police, and the truth gradually oozed out, until the facts as already stated were established beyond dispute; then the farmer not only admitted the fact of the disease among the milch-cows, but confessed to the sale of their cream and milk in Dover, not only to the dairyman whose milk was especially implicated, but also to another milkman, on two separate occasions, among whose customers a second simultaneous outbreak occurred; thus a second experiment was performed with this tainted milk among another set of individuals, with like results to the first, contributing additional evidence of the presence of poison in the milk supplied from the infected farm. Thus it was clearly established that the sufferers in this epidemic partook of milk which had been

secreted by cows suffering from foot-and-mouth disease. During the week ending February 9th, two hundred and five persons were attacked with this disease. The majority of persons who suffered during the Dover epidemic presented two prominent symptoms in common, viz; *inflammatory sore throat and enlargement of the cervical lymphatic* glands; but the lesions produced varied considerably in different cases. The vesicular eruptions were followed either by a raw, red, œdematous appearance of the mucous membrane, or white patches, and the ulcers which supervened assumed in many instances a chronic character, with thick, puckered edges, and were a long time in healing. When the inflammation went on to suppuration recovery was much slower than after common quinsy, and the enlarged cervical glands remained tender, red, and swollen long after the throat symptoms had subsided, *resembling in this aspect the sequelæ of* scarlet fever. Erysipelas and purulent formations were also concomitants of the epidemic. In some instances the feet of those who suffered were swollen and painful, simulating rheumatism; and in one instance eczema occurred between the toes of the feet, the affection being accompanied with very fetid exhalation. A fatal termination resulted in the cases of two children who had very bad throats and mouths, with the extension of the disease to the respiratory tract, their deaths being, in the opinion of the medical attendant, due to the poisonous effects of the milk. Two persons, who labored under chronic kidney disease, were respectively attacked with sore throat and died on the same day; other people in the same houses suffering also from the epidemic sore throat."

Having thus traced the course of foot-and-mouth disease as it occurred in the cases quoted, and thinking it manifested a certain resemblance to human scarlatina, I asked Dr. M. K. Robinson, medical officer of health of East Kent, England, if he would call upon the various persons who had been affected with the "epidemic sore throat," and ask them whether they had had scarlet fever either before or after having the "sore throat" in 1884, my object being to determine whether the human system, having been attacked by one of these diseases, would, as a result, become fortified against the contagium of the other.

TABLE.

Incidence of Scarlet Fever among Persons who suffered from "Epidemic Sore Throat" due to use of Milk from Cows suffering from Aphthous Fever, which Epidemic occurred in Dover in 1884.

No. of case.	Scarlet fever previously.	Scarlet fever since.	Remarks.
1	.....	.....	Four other members of same family, who had previously had scarlet fever, escaped epidemic of sore throat.
2	.....	.....	
3	.....	.....	
4	.....	.....	Five other members of this family, who had previously had scarlet fever, escaped throat epidemic.
5	1	.....	
6	.....	.....	
7	.....	.....	Two members of same family, who had previously had scarlet fever, escaped throat epidemic.
8	1	.....	
9	.....	.....	
10	1 ?	.....	Believed to have had scarlet fever, with other members of family, when young.
11	?	?	Gone away, no address found.
12	.....	.....	
13	.....	.....	
14	.....	.....	
15	?	?	Gone away, no address yet found.
16	?	?	
17	?	?	
18	.....	.....	
19	1 ?	.....	Not quite certain, but thinks to have had scarlet fever when young.
20	?	?	Gone away, address not yet found.
21	.....	.....	
22	.....	.....	
23	.....	.....	
24	.....	.....	
25	1	.....	Believed to have had scarlet fever when young.
26	.....	.....	
27	.....	.....	
28	?	?	Gone away, address not yet ascertained.
29	.....	.....	
30	1	.....	
31	.....	.....	
32	.....	.....	Same family.
33	.....	.....	
34	1	.....	Same family; 34 had scarlet fever when young; 35 uncertain.
35	?	.....	
36	.....	.....	Same family.
37	.....	.....	
38	?	?	Same family. Gone away, address not yet ascertained.
39	?	?	
40	?	?	Same family. Gone away, address not yet found.
41	?	?	
42	.....	.....	Same family. Other members of same family, two of whom had had scarlet fever, escaped epidemic sore throat.
43	.....	.....	

No. of case.	Scarlet fever previously.	Scarlet fever since.	Remarks.
44	?	?	Same family. Gone away.
45	?	?	
46	.....	.....	Same family.
47	.....	.....	
48	.....	.....	Same family.
49	.....	.....	
50	1	.....	Same family.
51	1	.....	
52	?	?	Same family. Gone away, address not yet found.
53	?	?	
54	.....	.....	Same family.
55	.....	.....	
56	.....	.....	Same family.
57	.....	.....	
58	.....	.....	Same family.
59	.....	.....	
60	.....	.....	Same family.
61	.....	.....	
62	.....	.....	Same family.
63	.....	.....	
64	.....	.....	Same family.
65	.....	.....	
66	1	.....	66 scarlet fever or measles, not quite certain.
67	.....	.....	
68	.....	.....	Same family.
69	.....	.....	
70	?	?	Same family. Gone away, address not yet found.
71	?	?	
72	.....	.....	Same family.
73	.....	.....	
74	.....	.....	Same family; consists of four children; one child, who had previously had scarlet fever, escaped epidemic sore throat.
75	.....	.....	
76	.....	.....	
77	1	.....	Mild case of throat epidemic.
78	.....	.....	
79	.....	.....	
80	.....	.....	Same household. Father, mother and servants, who had previously had scarlet fever, escaped throat epidemic.
81	.....	.....	
82	.....	.....	
83	.....	.....	Same household.
84	.....	.....	
85	?	?	Servant, cannot be found.
86	.....	.....	
87	.....	.....	
88	.....	.....	
89	.....	.....	
90	.....	.....	Same family.
91	.....	.....	
92	1 ?	.....	Mother thinks they had scarlet fever.
93	1 ?	.....	
94	1 ?	.....	
95	.....	.....	Same family.
96	.....	.....	
97	?	?	Servant, cannot be found.
98	?	?	Servants, cannot be found.
99	?	?	
100	?	?	

No. of case.	Scarlet fever previously.	Scarlet fever since.	Remarks.
101	.....	.....	Same family.
102	.....	.....	
103	.....	.....	
104	.....	.....	Same family.
105	.....	.....	
106	.....	.....	
107	.....	.....	Same family.
108	.....	.....	
109	.....	?	Servant, gone away.
110	.....	.....	Same household. Other members of this family, three of whom had had scarlet fever, escaped throat epidemic.
111	.....	.....	
112	.....	.....	
113	.....	.....	Same household.
114	.....	.....	
115	1	.....	
116	.....	.....	Same household.
117	.....	.....	
118	.....	.....	
119	.....	.....	Same household.
120	.....	.....	
121	.....	.....	
122	.....	.....	
123	.....	.....	Same household.
124	.....	.....	
125	.....	.....	
126	.....	.....	
127	.....	.....	
128	.....	.....	
129	.....	.....	
130	.....	.....	
131	1	.....	Mild case of throat epidemic.
132	.....	.....	Same household.
133	.....	.....	
134	.....	.....	
135	1	.....	Same household.
136	1	.....	
137	.....	.....	
138	.....	.....	
139	.....	.....	Same household.
140	.....	.....	
141	.....	.....	
142	.....	.....	
143	.....	.....	Same household.
144	.....	.....	
145	.....	.....	
146	.....	.....	
147	.....	.....	Same household. Other members, four of whom had had scarlet fever, escaped throat epidemic.
148	.....	.....	
149	.....	.....	
150	.....	.....	
151	?	.....	Servant, thinks had scarlet fever.
152	1	.....	Same household; mild cases of throat epidemic.
153	1	.....	
154	.....	.....	
155	.....	.....	
156	.....	.....	

No. of case.	Scarlet fever previously.	Scarlet fever since.	Remarks.
157	.....	.....	
158	.....	.....	
159	.....	.....	Same household.
160	.....	.....	
161	.....	.....	
162	.....	.....	
163	.....	.....	
164	.....	.....	Same household.
165	.....	.....	
166	1	.....	
167	1	.....	
168	.....	.....	
169	.....	.....	Same household.
170	.....	.....	
171	.....	.....	
172	.....	.....	
173	.....	.....	
174	.....	.....	
175	.....	.....	Same household.
176	.....	.....	
177	.....	.....	
178	.....	.....	
179	.....	.....	
180	.....	.....	
181	?	.....	
182	?	.....	
183	?	.....	
184	.....	.....	
185	.....	.....	
186	.....	.....	
187	.....	.....	
188	.....	.....	Same family. Removed. No reply to inquiry.
189	.....	.....	
190	.....	.....	
191	.....	.....	
192	.....	.....	
193	.....	.....	
194	.....	.....	
195	.....	.....	
196	.....	.....	
197	?	.....	
198	?	.....	Doubtful; do not think they had scarlet fever.
199	.....	.....	
200	.....	.....	
201	.....	.....	
202	.....	.....	
203	.....	.....	
204	.....	.....	
205	.....	.....	

These statistics were gathered two years after the outbreak of the "sore throat epidemic" in Dover. During this interval of two years 22 of the patients changed the place of their residence and could not be found, with but few exceptions, and from

these few it was impossible to secure replies. The tabulated facts concerning the remaining 183 persons show:

1st. That *none* of the persons affected with the "throat epidemic" have since had scarlet fever, *i. e.* had not had it at the time they were questioned.

2. *That members of eight families who had previously had scarlet fever escaped the "throat epidemic,"* while the remaining portion of the households developed the disease.

3. That 16 persons affected with the "throat epidemic" had had scarlet fever.

4th. That 4 of the 16 persons who had had scarlet fever had a *mild form* of the "throat epidemic."

5. That of the affected individuals 2 had had scarlet fever *when young.*

6th. That 10 of the cases were doubtful whether they had previously had scarlet fever.

May it not, therefore, be possible:

1st. That the affected persons have not since had scarlet fever because of the protective influence produced by the "throat epidemic."

2d. *That the members of certain households who had had scarlet fever had thereby secured immunity from the "throat epidemic," as indicated by the fact that they escaped.*

3d. That in four of the instances in which scarlatina had antedated the "throat epidemic" there was a partial protection afforded, as indicated by the fact that four of these cases were mild.

4th. That in those instances in which scarlatina had occurred in early youth the protection had become exhausted.

5th. That these two diseases may be for a time mutually protective.

It is certainly a remarkable fact that, in twenty-four or more instances, the throat epidemic failed to attack those who had already had scarlatina; also, that the few attacked with the throat epidemic who had had scarlatina, had, in one-fourth of the instances, a mild type of the epidemic disease, indicating, possibly, that the system had been so affected by the scarlatina contagium

as to become less susceptible to the virus of foot-and-mouth disease. That a certain number who had previously had scarlet fever were attacked by the "throat epidemic," is not strange, for it sometimes happens that an individual will have two attacks of scarlet fever, with, in some instances, only a short interval of time between the attacks. On the other hand, it may be true that the twenty-four or more individuals who had had scarlatina, and escaped subsequently the sore-throat epidemic, were not susceptible to the influence of the contagium which the infected milk contained. As is very well known, there are some persons who, though many times exposed to the poison of small-pox, measles, or scarlatina, remain unaffected by such exposure. In considering the facts before us I think this truth should have its share of thoughtful attention.

(*To be continued.*)

THE NATURE OF THE AMERICAN SWINE PLAGUE

IN REGARD TO ITS PREVENTIVE TREATMENT BY VETERINARY POLICE AND HYGIENIC METHODS.

By Frank S. Billings, D.V.M.

Director of the Experiment Station and Laboratory of the University of Nebraska for the Study of Contagious and Infectious Animal Diseases.

[Read before the Massachusetts Veterinary Association by its Secretary, Dr. L. H. Howard.]

(*Continued from page* 414)

Swine plague introduced or extended over the State by means of uncleansed and non-disinfected railroad cars or other conveyances the property of common carriers.

Cases of this kind are undoubtedly of common occurrence, though I have personal knowledge of but one, in which the disease first began along the line of a railroad and gradually extended from it. The cars were used at the time to convey rails and laborers, but had been used for swine previously, and their bottoms were covered with the straw and refuse left by them, which was spread over the ground in unloading the cars.

Could the authorities of the respective States be absolutely certain that swine purchased in other States were procured in

localities in which no cases of swine plague had occurred during the previous twelve months, still they cannot be assured that the disease would not break out in such swine shortly after arrival upon or within the territory of the State on account of their having been transported in cars or other conveyances, in which swine plague-diseased hogs had been previously transported, without said conveyances having been subsequently cleansed and disinfected.

(Numerous outbreaks of this kind due to imported hogs, as well as inter-State transport, have come to my knowledge since I have been investigating this disease.)

This fact, that buyers or shippers of swine cannot assure themselves that no sick swine have been conveyed in the cars or other conveyances, not only renders a quarantine absolutely necessary for imported hogs, but suggests the necessity of State authorities organizing some method by which cars and other public conveyances used to convey live stock either into or within the boundaries of a State should be properly cleansed and disinfected under the observation of a trustworthy inspector after their use for snch purposes.

Regulations to be observed when outbreaks of swine plague occur within the boundaries of a State.

All places where swine plague exists should be indicated by sign boards during the prevalence of the outbreak and for six months after it has ceased. Hog-pens or runs should be so situated that they can be well drained and exposed to the action of the sun and air.

(Thoroughly muddy runs are not as dangerous as those which practically dry out, if the disease appears in either. Filth alone is not the cause of swine plague, though under some circumstances it may help support it.) Hog-pens or runs should never be so situated that the drainage from them could gain access to the well from which animals are watered, or to running streams. Owners of hogs diseased with swine plague should be cautioned not to allow, and be held responsible for, any extension of the disease from their hogs to healthy swine belonging to other persons, when such owner or owners failed to comply with the regulations enacted for the control and prevention of the disease, such as:

1. The sale or removal of sick or healthy swine from herds, pens or runs in which the disease existed. The sale or removal of any other domestic animals from their premises that had the run of such hog-yards when swine plague existed among the hogs.

At such times owners should be forbidden allowing their horses or cattle, which are being used for driving or work over or upon any public highway, to have the run of, or from being led into or across the territory of such infected yards or runs. They should also be forbidden leaving any wagons or other farm machinery in such infected hog-yards or runs, even though the plague did not exist among their hogs at the time.

2. The removal of hay, straw, manure, offal or earth from swine plague-infested hog-yards or runs, or from such in which the disease had existed within the previous twelve months, and the conveyance of the same over any public way, or the unloading any dangerous material upon any part of such a public way should be forbidden by law.

(Owners of diseased swine should use every precaution in distributing such materials over any part of their own premises, as they may prove a source of disease to healthy hogs at any time.)

3. All hogs should be watered from wells.

a. Watering infested herds of swine, or even single animals, when diseased, from running streams, or allowing such diseased hogs to have any access to the banks of such streams, should be forbidden by law.

(That the disease frequently follows the course of and extends from the banks of such streams has been frequently demonstrated by costly experiences.)

b. Building rendering establishments or packing-houses in positions where the drainage from them can in any way gain access to running streams, should be forbidden by law.

4. Owners of swine plague-infested herds, or sick hogs, should be forbidden visiting the hogs of other persons, or allowing other persons to inspect their hogs, or enter their hog-pens or yards, unless such person was an authorized Government veterinarian or inspector.

5. The farm or house dog should be kept chained on premises

where the swine plague exists, and any stray dogs seen in or near the infested pens or runs should be shot.

6. Owners of hogs should be instructed (or, perhaps, forbidden) not to place new and healthy swine into hog pens or runs in which swine plague had existed at any time during the previous twelve months, and only then when all the hay or straw that may have been stacked in such a hog-yard or run had been consumed by other animals, and any refuse remaining had been completely burned up.

Any pens, sheds or stables in which or under which diseased hogs have been, must have been thoroughly cleaned out, and the contents of such pens or sheds completely burned up. Stables should really be so situated that the hogs could not possibly crawl under them, or any drainage from the hog-pens or yards run under them. When such has been the case, however, the stable should be raised, the refuse under it removed and burned, the bottom of the stable white washed (to which corrosive sublimate 1 to 500 parts had been added); the earth forming the bottom or under the floors of such pens or stables should be dug out to the depth of at least a foot, and then spread out in a thin layer over the hog-yard or run; the hole should then be filled with fresh earth. (It would be best to securely wall in the ground under a stable after such a procedure, so that swine could not get under it in the future and to provide for the water from the swine-pen or yard to drain in some other direction than under such a stable.) If such hog-pens or sheds have plank bottoms, the same should be removed and at once burned (this should be done upon the ground of the hog-yard when possible). When such pens or sheds have no plank bottoms, the lower boards of their sides should be removed and burned, the remainder should be whitewashed as above, three times within a period of three months.

The ground of the hog-yard or run should be plowed up and exposed to the air, and then harrowed fine when dry, three times within a period of three months after all diseased or exposed swine have been removed, or after thirty days had elapsed from the time all symptoms of illness had disappeared from the hogs, if any remained. (It will be readily seen that in most cases it

would be cheaper and more practical to place new hogs upon new land and in new sheds, but when such cannot be done the above regulations must be rigidly executed if another outbreak would be prevented upon the same grounds.)

7. In case such swine are placed upon new land great care must be taken that no person coming into any relation with them, or any teams used to convey food to them, cross the old grounds or come in contact with anything that may have been used among the diseased hogs. Tools, troughs and such things used among the diseased hogs should be burned and new ones provided for the fresh swine.

8. Owners of hogs should be warned against performing themselves, or allowing other persons to perform, any surgical operation whatever (castrating, ringing the nose, tagging the ears or branding) upon their swine when the plague existed in the immediate vicinity or among their own hogs.

9. Swine with wounds upon them or scratches should neither be placed upon previously infected lands or in such pens, nor among hogs in which the disease existed. All such swine should be at once removed from infected herds, if not already diseased themselves.

The disposal of sick and dead hogs.

1. No diseased or dead hogs should be removed from the infested premises.

2. Cremation or burning the carcasses of dead hogs until reduced to powder should be resorted to whenever and wherever possible.

3. The carcasses of dead hogs should never be thrown into running streams, or so buried that the drainage from such burial places could possibly gain access to such streams or even to wells or ponds used to water stock.

4. When cremation is impossible and burial has to be resorted to and the land is so situated that it can be done without conflicting with the previous regulation, a portion of the hog-yard or run, or land immediately adjacent to the same, should be fenced off with a solid board fence and a trench dug twelve feet deep and of a length corresponding to a space that would be occupied by

two-thirds of the hogs present. (If only a small number of hogs are present the trench should be dug deep enough to have six feet of earth over all the carcasses when covered.) As soon as any hogs have died the carcasses should be at once removed and some crude petroleum poured upon it; it should then be covered with a layer of quicklime and six inches of earth. The same should be done with each carcass. When the outbreak has come to an end the entire mass should be covered with six inches of quicklime and the trench filled up. No more hogs should be put into a single trench than would allow of six feet of earth to cover the carcasses. Such burial place should be kept securely fenced in for at least two years and sown down with some vigorously growing herbage.

When the situation of a hog-yard or run is such that a suitable burial place within or adjacent to the same cannot be had on account of running streams, wells or some other circumstance, a place must be selected as near as possible. The dead hogs should be carefully placed in a wagon and never dragged over the ground when being conveyed to such burial places. Such wagons should be cleaned and disinfected directly after being used for such purposes.

When can an outbreak of swine-plague be declared ended and the infested premises be declared free from the disease?

When all the diseased hogs have been buried; when the cleansing and disinfection of the pens, etc., and plowing up of the grounds of the infested yards has been performed according to regulation; or when there has not been a single symptom of disease among the remaining hogs after thirty days have elapsed from the complete recovery of the last sick hog, or no more sickness has occurred since the last sick hog was killed.

The above has reference only to the hogs remaining in an infested herd after the disease has run its course.

The treatment of such pens or yards, or the course to be followed in placing healthy pigs in the same, or upon the same premises, has already been given.

REMUNERATION.

Under what circumstances, or upon what conditions should

the State authorities be held responsible for outbreaks of swine plague within its boundaries?

When should the State remunerate owners of diseased or exposed swine on account of the above or on account of any action of the State authoritiee?

1. The State should not be held responsible for any outbreak of swine plague in domestic hogs, nor should owners have any claims for remuneration on account of any action or want of action on the part of the State authorities, when any owner or owners, or his or their representative, failed to comply with any or all the regulations of the State for the suppression and prevention of the disease, and swine plague broke out among his or their hogs.

2. The State should be held liable to the full value—as market animals only—of domestic swine when any outbreak occurred among such that could be traced directly to imported hogs or some negligence on the part of the State authorities, or through any action or want of action of any railroad officials or other common carriers, whereby the disease was introduced into or extended over the State.

(The State and central authorities must eventually regulate the relations, responsibilities and obligations of common carriers with regard to the extension of contagious and infectious animal diseases over the country, both with reference to intra and inter-State commerce.)

Whether or not the State should be held responsible for the negligence of owners of infested herds, and to what extent, and what should be the penalties placed upon owners or others guilty of misdemeanor in regard to swine plague, are questions I will not take upon myself to decide or even give an opinion upon, as they belong to legislators.

One thing must not be forgotten. Legislators must protect the rights of the State, and not award remuneration except where it belongs, as well as be just to the rights of the owners of diseased domestic animals. Owners who fail to conform to the law in every minor detail should never receive remuneration for any action on the part of the authorities.

COMPARATIVE LESSONS OF BRAIN WOUNDS.

By Dr. G. Archie Stockwell, F.Z.S.

(Written especially for the American Veterinary Review.)

(*Continued from page* 418.)

Atop of this a number of experiments personally undertaken by means of domestic and domesticated animals, seems to demonstrate conclusively the comparative innocuousness of brain wounds with free openings; as a rule they are less fatal, and more amenable to surgical measures, in ratio to loss of tissue, than solutions of muscular continuity or fractures of long bones, provided always that the demands of *sanitation*, *antisepsis* and *drainage* be complied with. In all these cases hemorrhage was slight as compared with the area of the lesion, and each and all exhibited large openings into the cranial vault and through the meninges, large suppurating surfaces and great toleration of the knife.

In contrast to the foregoing are two cases that terminated fatally, the one a patient of my own, the second that of a neighboring practitioner, and by whose favor I was present at the autopsy.

1. The details of this case are almost identical with those of the Norwegian (No. 4), as already given, the wound having been inflicted by the same saw. At first progress was favorable, but by neglect to comply with directions, the external wound closed, and I was summoned to find the man in convulsions. The prejudices of friends and relatives would not permit an incision into the cerebral cavity, and with a second convulsion life terminated. At the post-mortem two ounces of pus were found walled up within the cerebral substance!

2. A young man was wounded by a 22-100 calibre bullet from a pocket pistol, the missile entering half an inch to the right of the median line of forehead, and one and one-fourth inches above the supercilliary ridge. For a time he did well, a purulent discharge continuing from the wound for about two months. At last *hernia cerebri* appeared, and following the

books, was regarded as a *nolle-me-tangere*. The flow of pus stopped, evidences of compression supervened, followed by death. *Because the pus was surrounded by cerebral tissues* no measures were taken for relief! The autopsy revealed above three ounces of pus easily accessible in that it was situate less than an inch from the external opening of the wound. The bullet was found two inches farther back, imbedded and encysted in the right posterior lobe, its track practically invisible, conclusively demonstrating it at least was out of the way for harm.

The first series of cases illustrate the necessity, first and foremost, in injuries involving the brain itself, of *free drainage*. Therein lies the whole secret of what, in the light of the teachings of the hour, were deemed miraculous recoveries. In the very magnitude of the wound and laceration lay the elements of safety (1) in the avoidance of compression, and (2), in the reduction of concussion to a minimum.

In the experiments before mentioned, undertaken upon lower animals, every case recovered promptly and readily where the wound was persistently kept open, with free escape for inflammatory products, and with less detriment to general health than commonly accrues to injuries and wounds of other portions of the physical economy; and the exceptional freedom from shock and surgical fever and reflex phenomena was especially notable.

I have already spoken of *hernia cerebri* as a *bugbear*, for such it truly is, and little reflection will convince the most skeptical that the "masterly inactivity" inculcated regarding surgical interference is a gross error resultant upon blundering misconception. For instance, Nancrede, while discussing the subject of cerebral hernia, voices the opinion of the medical profession generally when he says*: "*The less done the better, as the cause primarily is loss of support!*" and, again, that interference "*must be avoided, especially when granulations are springing upon or around the protuberance, as we thus remove pressure and encourage growth!*" Atop of all this he insists upon resort to compression with a view of forcing the mass back upon its matrix.

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* *International Cyclopædia of Surgery.*

High as this author deservedly stands, the impression will assert itself that those who corroborate and voice such teachings have never chanced to observe the brain in any animal possessed of the full vigor of life. Nothing can be further from the truth than to imagine the cerebral organ a soft, pulpy, pudding-like mass, or a gelatinous substance such as it sometimes appears after death. On the contrary, it is a firm and elastic organ, possessing peculiar homogeneity; its individuality is such that it leaves its impress upon the inner table of the skull during development and growth. Again, the discussions excited regarding *hernia cerebri* for the most part deal with *effects* rather than *causes*, and pathology has been ignored in the desire to secure "*safe treatment.*"

In fact *hernia cerebri* may be the sequel of three different conditions: 1. A tumor, composed of partially or wholly disorganized brain substance. 2. Brain matter, protruded by inflammatory processes within the cranial vault. 3. Exuberant or excessive granulations, springing from damaged cerebral tissues. What then?

If a hernia is composed of disorganized tissue, certainly the animal economy derives no benefit from its retention; it is a clog and excrescence, is probably irritative, and therefore the more quickly removed the better, as a means of checking or forestalling more grave disturbance.

If protruded by inflammatory processes, is it not *prima facie* evidence of danger lurking behind—an accumulation of pus perhaps, as in the two fatal cases above cited; and in such case does not *common* as well as *surgical* sense dictate an outlet should be afforded for such inflammatory products, and a portion of cerebral tissue sacrificed, if need be, for the preservation of the whole? That the knife is always demanded is not certain. No doubt aspiration would fullfil all indications oftentimes.

Exuberant granulation is repressed by the free use of scalpel or caustics in accordance with demand when occurring in other parts of the body, therefore it is a logical sequence that the same should not be neglected merely because the tissue is cerebral, especially as all evidences go to prove that the brain is most

tolerant, and the drain of sloughing (within limits) less taxing to the economy at large.

Cerebral hernia is never of immediate or early occurrence, as it would be if the claim set up by Nancrede and his supporters were true; it is invariably a secondary complication, and commonly attendant upon suppurative and reparative processes. All support has frequently been removed from considerable areas of healthy brain, and without the slightest indication of falling, sinking or protrusion of the injured surfaces; and in the case of the canine before alluded to, above all others, there should have been such collapsing of cerebral walls, yet the wound not only retained its original form and contour until healed, but the lost substance of the brain was replaced by act of granulation precisely the same as with muscular tissue. Again, the hernia is often found protruding from small openings, giving evidence of considerable force behind, as in the case of the unfortunate wounded by a 22-100 bullet, and this force can only be a powerful effort on the part of nature to free the brain from impending fatal pressure dependent upon inflammatory products; it is the *pouting of the abscess* in fact, and the merest tyro in pathology need not be told that *compression* would but illy compensate for the knife in furuncle or paronychia. Yet, without classifying causes, we are told that in this one, the most severe and fatal form of abscess, and where absorption positively *cannot* take place, the knife must be avoided, and compression alone resorted to!

It would seem to me, at least, that further hesitation or doubt as to the propriety of employing knife, aspirator, cautery or ligature, as occasion may suggest, for the *removal* of cerebral hernia that is already giving evidences of mischief, is most reprehensible; personally, I would not delay or await such manifestations. Witness the case of Doctor ————'s* daughter, reported in the *Journal of the American Medical Association* during February of the current year, and the happy seqnel to ligation of snch a

* The name has escaped me, and my copy of the *Journal* is not at the mo ment available. The account is of a large cerebral tnmor removed by ligation, and occurs on page 150 of the *Eighth* Volume.

tumor! Or consult the "Medical and Surgical History of the Civil War," where in not a single instance—and there are several examples given by a surgeon who was "wise beyond his time"—is there an untoward result.

One word more in connection with this subject. The experiments with intradural inoculation as practiced upon lower vertebratæ, has a direct bearing upon the treatment of cranial wounds and fractures, and leads me to corroborate a recent assertion of Dr. Roberts, of Philadelphia, that trephining is attended with trifling risk if carefully performed under antiseptic precautions—"less than the amputation of a digit or removal of a metacarpal bone." The comparative result is *three per cent.* of futility in the former, against *four and one-half* per cent. for minor amputations, while the benefits accruing to the trephine are immeasureably overwhelming! All depressed fractures, all spiculæ of bone, all bullets or other foreign substances or their fragments, within or upon the brain, are a perpetual menace to life so long as they remain. By the trephine epilepsies and choreas of long standing have been relieved, oftentimes permanently, one author alone claiming a ratio of *fifty per cent.* Insanity has fled before the removal of extravasations of blood, evacuations of pus, and irritation and probable (ultimate) fatal compression avoided. I recently learned also that Drs. Fenger and Lee, of Chicago, aspirated a cerebral abscess by means of a hypodermic syringe with the happiest of results. Cerebral localization, yet in its infancy, with the drainage tube as an auxilliary, opens up a new era in cerebral surgery and pathology, both veterinary and general. The opportunities afforded veterinarians for the further development of cerebral pathology exceed those of the general practitioner, especially as to its relations to epilepsy, chorea and paralysis, for these, despite the amount of literature specially devoted thereto, are yet little more than unsolved enigmas. Cerebral localization in man and the lower animals is but the key that will unlock the mystery now attendant upon diseases of the central nervous system, along with their attendant reflex phenomena.

REPORTS OF CASES.

INCOMPLETE FRACTURE OF THE METACARPAL BONE.

By W. Pendry, D.V.S.

On September 30th I was called to see a fine team of six-year-old carriage horses, said to have been hurt by coming in contact with some iron girders laying on the street. The one horse had received several bad cuts, but of no particular nature, which unfortunately was not the case with the other horse, he having received a far more serious injury, being a badly lacerated wound on the outside of the off fore leg, about six inches below the carpal joint; the tendinous portion of the lateral extensor of the phalanges being completely cut through and the periosteum removed, so that the smooth surface of the bone was exposed, showing an oblique, incomplete fracture of the metacarpal, extending for about four inches from forward backwards. After examination I gave it as my opinion that the injury could be repaired with proper treatment. The horse with the more serious injury was removed to the owner's stable in an ambulance and placed in slings. An attempt was then made to unite the severed tendon, but the upper portion was found to have contracted and could not be reached, even after a dissection of about two inches had been made for it. The hemorrhage being considerable and the lower portion of the tendon becoming so enlarged and congested, I decided to close the wound by drawing together what little skin was left by suture and to dress antiseptically, using a solution of sulphate of zinc and carbolic acid. In a few days the stitches sloughed out, being soon followed by a bad sloughing of the tendinous portion of the extensor, the periosteum coming away at the same time, leaving the surface of the metacarpal bone. The sloughed portions were removed as fast as possible and dressed as before stated. In ten or twelve days I had a very healthy looking wound, which received a fresh dressing each day, without any further complication, except a considerable congestion of the back tendons, which happily subsided in a week or so with simply a slight cutaneous slough.

What I consider worth recording is the—in my opinion—remarkable rapidity nature displayed in repairing the injury in this case. The horse had to be literally carried from the ambulance to his stable, the foot knuckling completely over when trying to walk, and in five weeks was able to travel the length of the stables and back, with only once slightly tripping. The granulations were of course controlled by pressure, and cut down, when necessary, with a fifty per cent. solution of the chloride of zinc; the leg being kept straight with a heavy sole leather legging made to fit the leg from the foot to the elbow, over the dressing and bandages, and secured with other bandages; the result is, that there is very little elevation of the location of injury and a pretty straight leg. Within six weeks the case was discharged as convalescent, with instructions to give three months perfect rest.

BOOK NOTICES.

MANUAL OF COMPARATIVE ANATOMY OF THE DOMESTICATED QUADRUPEDS. By N. Hormasji Edalji Sukhia.

A concise aberge of the osteology, syndesmology and myology of our domestic animals, condensed in a small volume of some 250 pages, which the author, Demonstrator and Lecturer on Anatomy at the Veterinary College of Bombay, has issued with the object of facilitating the studies of the younger students of anatomy. Not ignoring the superiority and advantages that are presented to the students of anatomy by such works as those of Steele, McFadyean, Fleming and Strangeway, Mr. Sukhia believes that many of the difficulties that are encountered by the beginner will be overcome by a careful reading of his little Manual. It is undoubtedly a good work, which does credit to the ability of the author, containing an enormous amount of well collected information, which we believe will be most valuable to the beginner in this important branch of medical studies.

SOCIETY MEETINGS.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular meeting of the Massachusetts Veterinary Association was held in Boston September 28th, 1887, at 7:30 o'clock, P. M., President John S. Saunders in the chair.

There were present Drs. Blackwood, Lee, Marshall, Howard, Osgood, Peters, Saunders, Smith, Stickney, Winchester, K. Winslow, and Cattle Commissioner A. W. Cheever.

On motion of Dr. Winchester the reading of minutes of the previous meeting was dispensed with, and the consideration of certain new business before the Association and adoption of a revised code of ethics were laid over to the next meeting, to be held Octoher 26th.

The Executive Committee reported they were awaiting the presentation of credentials of the following gentlemen who had applied for membership, viz.: J. C. Fogg, V.S.; Wm. Ferguson, M.R.C.V.S.; Wm. H. Hitchings, D.V.S.; C. P. Lyman, F.R.C.V.S.; Roland Lord, M.R.C.V.S.; Kenelin Winslow, M.D.V., and could not report on the applications until the credentials were sent in for examination.

The meeting then listened to the following paper by A. Peters, M.R.C.V.S., of Boston:

Infectious Bovine Pneumonia.

Mr. President and Gentlemen ;—I do not know that it is a matter of record that there is an infectious pneumonia affecting the bovine race, and I therefore thought that it would be interesting to you to read you a few facts concerning it. Last summer I was requested by the Cattle Commissioners of the State of New Hampshire to repair at once to South Lyndsboro, in Hillsboro county, to investigate an epizootic of pneumonia among the young cattle in Hillsboro and Cheshire counties.

I left Boston Friday morning, July 29th, for South Lyndsboro, proceeding at once to the farm of a Mr. Levi Spalding.

Mr. Spalding manages a large tract of land, comprising what was formerly a number of farms, his principal pasture covering most of a large hill known as Lyndeboro Mountain. During the summer and spring a number of deaths have occurred among the cattle pastured on Lyndeboro Mountain, from what I should designate as an infectious pneumonia, which attacked yearlings chiefly. The disease appeared early last spring, before the cattle were turned out to pasture, among some cows which came from Concord, Mass.; one died then, and another soon after they were turned out; three others which were sick recovered.

Since then the deaths have been confined to yearlings, I believe, seven of which died; there were also in this pasture (August 1st, 1887,) three yearlings which were sick, but they seemed to be recovering. I examined two of these:

No. 1.—Red yearling heifer, temperature 102°, moist rales on the right side, no marked dullness on percussion.

No. 2.—Yearling steer, red, with white face, temperature 103°, other symptoms similar to No. 1.

No. 3.—Black yearling heifer: was too wild to approach, but seemed to be convalescing. Mr. Spalding said she had lost a good deal of flesh within three or four weeks.

In addition to these creatures Mr. Spalding had a cow, five years old, on a farm at the easterly end of the mountain, which presented similar symptoms to those manifested by the young cattle on the mountain. Her temperature was, Saturday morning, July 30th, $102\frac{3}{5}^{\circ}$, breathing rapid and jerky, no marked dullness on percussion, but on auscultation moist rales could be heard over both lungs, husky cough, conjunctivitis, sore throat, skin dry and scaly, and cow somewhat emaciated. The milk was said to have a bitter taste, and that morning had to be thrown away.

In a pasture on the Dunckley farm, on the north side of the mountain, there was another cow which had been sick, but was evidently convalescing, belonging to Andrew Holt, brother of Dr. Holt, Surgeon-General of Massachusetts.

On the morning of July 31st, Dr. Holt and myself examined this cow carefully. Her temperature was $101\frac{1}{2}^{\circ}$, breathing rapid and jerky, no marked dullness on percussion, moist rales over both lungs on auscultation. She had aborted a few weeks before. At that time she was probably in a high state of fever, and abortion is not uncommon among cows when the temperature runs very high.

After finishing our physical examination, the animal was destroyed and a post-mortem examination made.

Autopsy revealed disease of both lungs, the small bronchii being full of a frothy material, the lungs not collapsing to the same extent as in a state of health after opening the thorax, and they presented an appearance of a case of pneumonia undergoing resolution. The postero-inferior portion of the right lung still had a somewhat hepatized appearance. The peritoneum showed patches of inflammation, appearing in places to be thickened and congested, slightly ulcerated in a few spots.

The other organs, as far as a hasty post-mortem would allow, appeared healthy.

The animals attacked with this disease die in the course of the first four or five days, during the congestive stage. If they live beyond this period they slowly recover, but lose a good deal of flesh in consequence. Yearlings, on account of their youth, suffer most seriously; milch cows are occasionally attacked, owing to the depleting influence of lactation; other cattle appear to have a resisting power to the influence of the infectious principle.

Outbreaks of a similar disease were reported from various towns in Cheshire county earlier in the season, but inquiry among the farmers there showed that very little sickness had existed among the cattle in that locality this summer, and at the time of my visit the young cattle in the pastures of Cheshire county appeared to be healthy. At the time of making the post mortem on the Holt cow I inoculated some test tubes of agar agar from the fresh cut surface of the hepatized portion of the lung. In one of these test tubes an almost pure growth of a small micrococcus developed. I got a pure cultivation of this in a second generation on agar agar. It formed a slowly growing white colony on the surface of agar agar, and formed small colonies close together along the needle track.

From this cultivation I inoculated some test tubes of veal broth, August 17th,

and after allowing the micrococci to develop in it until August 24th, I inoculated two guinea-pigs from the culture. For this purpose I used a sterilized hypodermic syringe, and injected the culture under the skin of the abdomen. To distinguish these guinea-pigs, I will call them No. 1 and No. 2.

August 27th, three days after inoculation, No. 1 was noticed to have some difficulty in breathing. Respiration was rapid and somewhat labored, and when held up close to the ear the respiratory murmur was so harsh and loud that it could be easily heard over both lungs. Otherwise he did not appear to be particularly sick.

August 28th—No. 1 appeared the same as day before.

No. 2 showed symptoms similar to No. 1's, but not so well marked.

August 29th—Pig No. 1 is killed. The autopsy showed the viscera in an apparently healthy condition, excepting the lungs. The anterior lobe of the left lung is hepatized, and the posterior portion of the right lung very much congested.

Several test tubes of agar agar are inoculated from the diseased portions of lung.

Pig No. 2 is kept for further observation.

September 2d (Friday)—Pig No. 2 seems sicker to-day than at any time since he was attacked.

September 9th—Pig No. 2 has steadily improved since Sept. 2d, and is now nearly well.

Examined cover glass preparations from second generation of cultivations from lung of pig No. 1 (second generation being raised in order to get a pure culture, the first being mixed).

The cultivations present the same appearance in agar agar as those used to inoculate the pigs, and also have the same appearance under the microscope.

Sept. 15th—Guinea-pig No. 2 appears well again, and is rapidly regaining the flesh which he has lost.

I had a telegram on the morning of Sept. 13th from the New Hampshire Cattle Commissioners, to proceed to Cornish, N. H., and investigate a supposed outbreak of contagious pleuro-pneumonia.

Cornish is in Sullivan county, north of Hillsboro and Cheshire counties. I immediately repaired to the scene of action, and found a similar state of affairs prevailing to those witnessed on Lyndeboro Mountain earlier in the season. Here I find that a number of steers, chiefly two-year-olds, brought from the West a few weeks ago, have been turned out to pasture.

They were brought on from Iowa, three or four weeks before my visit, passigg through the Chicago stock yards on their way. The drove originally numbered 110, but small lots were sold, from time to time, until only 44 remained. The week before my visit some of these sickened, four died, and one was killed, so that when I saw them (Sept. 14th), but 39 remained. Five of these were sick, their symptoms resembling those of the sick cattle seen on Lyndeboro Mountain the last of July. Of the five, four were convalescing and one was still in the acute stages of the disease, having a temperature of $105\frac{1}{2}^{\circ}$ F.

I had the animal which had most recently died exhumed for an autopsy. As he died Sunday night and was buried Monday morning, he was still (on Wednes-

day, Sept. 14th) in a tolerably good state of preservation. Upon opening the thoracic cavity and examining the lungs, I found them both to be very much congested, but hepatization had not commenced, and they did not display the slightest evidences of contagious pleuro-pneumonia.

Other lots of these steers, sold before sickness appeared among them, are, I was told, doing well. One lot sold since they were attacked, I heard, had one or two sick among them.

I think the outbreak at Cornish is chiefly due to the fact that these young cattle, coming from a distant part of the country, and after a long, fatiguing journey, were more susceptible to such a disease than cattle which had been in the locality all summer.

The farmers of the vicinity, knowing that these cattle had come through the Chicago stock yards, where there was an outbreak of contagious pleuro-pneumonia last year, were naturally very much alarmed. Dr. F. C. Wilkinson, of Claremont, and Dr. Geo. H. Farnsworth, of Rutland, Vt., two local veterinarians, made a post-mortem examination of one of the steers, and gave it as their opinion that the disease was contagious pleuro-pneumonia. This greatly increased the public excitement.

When I made the post-mortem on the animal I had dug up, there were twenty or thirty farmers present, and the selectmen told me if it had been generally known that I was coming, the audience would have been very much larger. Of course, they were very much relieved to find that the disease was not contagious pleuro-pneumonia.

Conclusions.—1. From the above we can safely conclude that this is a specific infectious lung disease, due to the presence of a small micrococcus.

2. That its effects are shown on the lungs, whether inhaled or introduced iuto the circulation in any other way.

3. That animals attacked by it may entirely recover.

4. That the germ may be easily isolated and cultivated.

Animals attacked by it should be isolated until they have entirely recovered. Animals that die should be buried, or, better still, cremated.

If they are worth treating, the same treatment should be adopted as in ordinary sporadic pneumonia.

Whether one attack gives immunity from subsequent attacks, remains to be determined.

Further study of the micro-organisms causing the disease may be productive of additional knowledge concerning its character.

Horses pastured with cattle suffering from the disease do not show symptoms of pneumonia; a number of horses being in the Lyndeboro pasture when the cattle were sick. I was told that the horses all had "pink eye" early in the summer. Whether this disease and equine influenza bear any relation to each other, I cannot say.

At the conclusion of the paper, Dr. Peters showed microscopical preparations of the cultivations of the germ of this disease.

Dr. Osgood said that he had on one occasion met with similar cases in a lot of young bulls shipped from Chicago. They had been a week or ten days in

transit, and several of them had died. A post-mortem examination revealed disease of the respiratory organs only, viz., a congestion of the lungs and bronchia, and he diagnosed the disease an infectious broncho-pneumonia, the exciting cause being exposure in transit. These cases had been said to be, by some one who had previously examined them, Texas fever, but in his opinion they were cases similar to the ones described by Dr. Peters in his paper. The animals affected were shut up with Jerseys, and if the newcomers had Texas fever, in all probability it would have appeared among the Jerseys, which, however, did not happen.

Dr. Winchester said that the essayist had spoken of the disease as *infectious*, but was it not enzootic, or miasmatic? Has not every specific disease a germ, and could he not take the germ of equine pneumonia and cultivate it?

Dr. Marshall said he thought the entire cause might be the climatic conditions.

Dr. Winchester said the Cattle Commissioners of Vermont had lately called on the Massachusetts Board with specimens of this lung disease, thinking they had an outbreak of contagious pleuro-pneumonia. Their cases had been examined by the same parties who had previously pronounced the cases investigated by Dr. Peters in New Hampshire to be contagious pleuro-pneumonia. The hepatized portions of the lung in these cases seem to be different from ordinary hepatization, in that they won't sink in water. The mortality is about 50 per cent.

At the conclusion of the discussion, on motion of Dr. Howard, a unanimous vote of thanks was tendered Dr. Peters.

Adjourned to October 26th, Wm. H. Hutchings, D.V.S., being appointed essayist for that meeting.

L. H. Howard, Secretary.

NEW JERSEY STATE VETERINARY SOCIETY.

The New Jersey State Veterinary Society met in convention at the United States Hotel, in the city of Newark, N. J., on Thursday, October 27th, with Dr. J. C. Corlies in the chair.

Although as now incorporated the membership consists exclusively of graduates of chartered veterinary colleges, yet the attendance was larger than at some of the meetings of the old Association, which admitted both graduates and non-graduates to membership, thus showing that the veterinary profession of New Jersey recognizes the imperative necessity of a complete emancipation from quackery and its associations.

The minutes of the reorganization meeting were read by the Secretary and adopted.

The Secretary presented a certified copy of the certificate of incorporation, which he had received from the Hon. Henry C. Kelsey, Secretary of State, at Trenton.

Appropriate resolutions were passed in the matter of the death of Dr. Edmund Chambon, of Jersey City, one of the men who assisted in the establishment of the Association on its present basis. Dr. Chambon stood high in the

profession, he having graduated with distinction at the Imperial Veterinary School at Alfort, France.

The Board of Censors reported favorably on the application of Dr. W. H. Mook, of Metuchen, and he was unanimously elected to membership. The other applicants, not being graduates, were rejected.

Many letters of encouragement had been received by Dr. Lowe from eminent veterinarians, at home and abroad. Letters from the following gentlemen were read amid enthusiasm :

Professor Liautard, Dean of the American Veterinary College; Prof. McEachran, Principal of the Montreal Veterinary College; Prof. Chas. P. Lyman, of the Veterinary Department of Harvard University; Prof. James Law, of Cornell University; Prof. Huidekoper, of the Veterinary Department of the University of Pennsylvania; Prof. James L. Robertson, of the American Veterinary College; Prof. A. H. Baker, of the Chicago Veterinary College; Dr. Ezra M. Hunt, Secretary of the New Jersey State Board of Health; Prof. Chas. B. Michener, of the American Veterinary College; Dr. George Fleming, of London, England, and others.

An able address was delivered by President Corlies on the recent equine epidemic in New Jersey. While he admitted that isolated cases of spinal meningitis occurred in different parts of the State, yet he considered that it was a misnomer to apply this term to the recent outbreak. He did not think that there was any name for it that was comprehensive, consequently he had coined a name himself—"carbo-hæmia." The Doctor claimed that the disease was due to an excess of carbonic acid generated in the system—that the blood was not oxygenized. He had made two post-mortem examinations, and found the blood of a veinous character, intensely black, with ante-mortem heart clots, together with other marked lesions of like character. There were no traces of lesions of the brain or spinal cord.

Dr. Corlies' remarks led to a prolonged, but beneficial, discussion on differential diagnosis between spinal meningitis, typhoid influenza, and carbo-hæmia, in which Drs. Nayler, Mook, Sherk, Krowl, Vogt, Mercer, Satter, De Clyne and Lowe took part. So much interest was taken and clinical experience related, that some of those present thought that the time had been better occupied than if they had listened to an elaborate essay.

The subject of veterinary legislation again received a due amount of attention, and it was the sense of the meeting that the proposed bill to regulate the practice of veterinary medicine and surgery should be modified and so drafted that both classes of practitioners would be allowed to register—the graduates as "Regular Practitioners," and the non-graduates as "Existing Practitioners," but that the time of allowing the latter class to register would be limited to six months after the passage of the act. While by this method all those who have assumed the right and are practicing for a livelihood would be allowed to register and continue such practice, provided they registered within the specified time, yet it made a distinction between the educated veterinarian and the empiric. At the end of the six months a complete register of all those non-graduates who shall have availed themselves of the opportunity could be obtained, and after that time only graduates could register, and no new name could be added to the regis-

ter of "Existing Paactitioners," so that in the near future benefit would be derived from such legislation.

Dr. Krowl promised to read a paper on "Phlebotomy in Veterinary Practice."

It was decided to hold the next meeting of the Association in Trenton. A banquet was held in the evening.

WM. HERBERT LOWE, D.V.S., Secretary.

The meeting of the Long Island Veterinary Society was held on the 21st of December.

The New York State Veterinary Society held one of its quarterly meetings on the second Tuesday of December.

The annual meeting of the Kansas State Veterinary Medical Association was held on the 16th of December, at the Fifth Avenue Hotel, at Topeka.

CORRESPONDENCE.

PATHO-BIOLOGICAL LABORATORY, STATE UNIVERSITY OF NEBRASKA.

My Dear Sir :

I beg to call your honorable attention to the fact that this Laboratory has been established *for original research into the nature and causes of the contagious and infectious diseases of animal life.* It has a general working-room, supplied with all the necessary instruments and books of reference; a cultivating room; an autopsy building, and room for raising and keeping the small animals generally used in experimentation.

While established entirely for investigation, still it is my desire to make the Laboratory as useful to the country as possible; hence, I think that its advantages should be offered to Boards of Health, Live Stock Commissions and Educational Institutions that may desire to have some attaché instructed in these special branches. I can truly say that this Laboratory offers better advantages for such work than any other in the country, as we are constantly busied in original investigations upon quite a number of diseases, and can thus give those desiring it an opportunity of at once proceeding in such work, and the immense advantage of

publishing their own, which should be a direct endorsement of their competency. We will supply workers with animals and everything necessary, except a microscope, slides, and covering glasses. In order to cover the expense of material used, a fee of $100 will be charged.

Time of attendance will not be limited; but as our rooms are small and only originally intended for our personal use, we can accommodate but two persons at once. No one but graduated physicians or veterinarians will be admitted, and such persons must have the endorsements of Boards of Health, Live Stock Commissions, or president of a university or college, with which they must be connected.

Your obedient servant,

FRANK S. BILLINGS, Director.

LINCOLN, Neb., Nov. 28th, 1887.

VETERINARIAN WANTED.

WASHINGTON, Mo., Dec. 5, 1887.

Editor American Veterinary Review:

DEAR SIR.—Please post the following on your college bulletin:

A splendid opportunity for a veterinary surgeon in a beautiful city of 5,000 inhabitants, and a rich and wealthy surrounding country. We have a "quack" veterinarian here, who is humbugging our farmers in a shameful manner and is making "big money."

If a graduate from your college would locate here, he could procure the confidence and practice of all of our intelligent horse and cattle breeders.

We have several *large* stock breeding farmers, who handle scores of fine horses and cattle, whose patronage could be *easily* obtained and a well paying practice established by locating here permanently.

For further particulars address

O. L. MUENCH, Ph.G., M.D.

NEWS AND SUNDRIES.

The Nature of Tetanus.—Dr. Shakespeare, pathologist to the Philadelphia Hospital, read a paper upon Tetanus before the Section of Pathology at the International Congress, in which he related a series of experiments consisting in inoculations of rabbits with material obtained from the medulla and spinal cord of a horse or a mule which had died of traumatic tetanus. The inoculations were based on the methods adopted by Pasteur in rabies, and included injections beneath the cerebral dura mater, as well as subcutaneous and intermuscular injections. He concluded from these researches that traumatic tetanus of the horse and mule is somtimes, if not always, an infectious disease, transmissible to other animals, and therefore possibly to man; and that the virus, elaborated and multiplied during the progress of the disease, is capable of reproducing the disease in other animals by inoculation beneath the dura mater. The virus is contained in the medulla and spinal marrow, and, like that of rabies, is capable of attenuation by exposure to dry air at a temperature of summer heat. It also resembles the rabic virus in producing more intense effects when inserted beneath the cerebral dura mater than when injected subcutaneously or between muscles. Dr. Shakespeare reserved conclusions as to the prophylactic effect of inoculations of the attenuated virus, and pointed out that his results, in connection with those of Nicolayer, Rosenbach and others, suggested forcibly the dependence of traumatic tetanus, both in animals and man, upon the action of a specific infectious virus, and the probability that man may acquire the disease from animals—notably the horse.

A Congress to Discuss Tuberculosis.—A congress of physicians and veterinarians, with the view of discussing the subject of tuberculosis in man and in animals, is announced to be held from July 25th to the 31st, in the rooms of the Faculty of Medicine, Paris. Professor Chauveau will preside.

Peripneumonia and Cow's Milk.—A series of investigations (Lecuyer, Centr. for Kinderk. May 16, 1887.) has led to the conclusion that the unboiled milk of cows suffering from lung disease is liable to produce croupous pneumonia in human beings, the anatomical appearance of which is like that which occurs in cattle. The autopsies upon two children who had died under similar circumstances, and with clinical phenomena similar to those which are seen in lung disease in cattle, showed thickening of the pleuræ, extensive adhesion of the costal to the pulmonary pleura, dilation of the lymph space extending from the sub-pleural to the interlobular connective tissue, and infiltration of the interlobular connective tissue with bloody serum. At the time when the two children were taken sick an epidemic of lung disease was prevailing among the cattle in their vicinity. This coincidence is important, and should excite pathological investigation in this direction.—*The Archives of Pediatrics.*

Aged Animals.—We find mention of the age attained by various animals in our English namesake, as follows: "A notice lately appeared of the death of a brown water spaniel at the age of 28 years. She had belonged to the same owner from a puppy, and died literally of 'sheer old age.' A few months before a cat died at the age of 22 years and 2 months. These are very unusual ages, though it is probable that some individuals have lived still longer. Herbiverous animals are generally thought to outlive carniverous ones; and of the former class those dedicated to labor appear to furnish the greatest number of instances of longevity. Two years ago a donkey died at Cromarty that was known to be at least 106 years old. It could be traced back to the year 1779, when, at an unknown age, it came into the hands of the then Ross of Cromarty, and it lived in the same family, 'hale and hearty,' until a kick from a horse ended its career. No horse is known to

have attained to anything like such an age as this; but a few have lived to ages varying from 40 to 50 years. A famous old barge horse died at Warrington in his sixty-second year; and the oldest horse known in New York was, until quite recently, doing steady work there at 38 years of age. A few months ago, also a mule 46 years old died at Philadelphia."—*National Live Stock Journal.*

Glandered Horses in Maine.—The cattle commissioners recently paid $175 for three glandered horses condemned and destroyed at Oldtown. There is no question but horses diseased with glanders ought to be put out of the way, but there is a question whether we want a law that will pay such prices in compensation for stock already rotten with disease.—*Maine Farmer.*

Glanders in Tippecanoe County, Indiana.—We take the following extract from the *Indiana Farmer*, Indianapolis: "Considerable excitement has been aroused in the vicinity of Farmers' Institute, Tippecanoe County, Ind., over the discovery that glanders, in very serious form, has broken out among the horses in that neighborhood. A veterinary surgeon found two horses belonging to A. H. Crouse very bad, and by order of the board of health officer they were shot. Other horses have contracted the disease, it is claimed, but the owners deny that it is the glanders, and decline to kill their animals. The veterinary pronounces the disease acute glanders."

Glanders in the Crow Reservation.—The following was sent from Washington last Saturday: "The Secretary of the Interior has received, through the Commissioner of Agriculture, a communication from Gov. Leslie, of Montana, transmitting a report from the veterinary surgeon of that territory, relating to the disease known as glanders, existing in horses within the Crow Reservation, and also a letter from Indian Agent Williamson on the same subject. The veterinarian says that after making an investigation of the character of the disease, during which several chronic cases of glanders were discovered and the animals destroyed, he is fully satisfied that the disease prevails to a limited extent among the horses on the reservation, and says that he

regards it as most important that steps be taken to stamp out the disease while it is in its incipiency. The Indian agent joins the Governor and the veterinarian in urging immediate action and asks that provision be made to recompense the Indians for affected horses killed. The Commissioner of Agriculture recommends that as the Bureau of Animal Industry has no jurisdiction within the reservation, the Interior Department take such steps as are necessary to cause the destruction of the affected horses in order to prevent the spread of the disease, and to protect the lives of the people as well as the animals of the adjoining States and territories.—*Nat. Live Stock Journal.*

Death from Glanders in Illinois.—A young man 24 years old recently died in Lincoln, Ill., with chronic farcy. It seems that he was inoculated last summer in being injured by a horse had which glanders, and which he was fumigating with tobacco smoke.

Death of a Woman from Glanders.—The following account of a horrible death from glanders was sent from Elgin, Ills., last week: "There died at the county poor farm, a few days ago, Minnie Sorenson, who had been a public charge for about three years. Before that time her husband was employed by a farmer of this township. He was prostrated with a virulent disease which baffled the skill of physicians. Finally it developed that he had cared for a horse which was sick with the glanders. The man had been inoculated with the virus. After great suffering he died. His wife, meanwhile, had contracted the fatal affliction from her husband. It appeared in a somewhat milder form. Great abscesses formed, and there were the same symptoms about the nasal passages and throat that are seen in a horse so diseased. No pains were spared to effect a cure, and for a time it was thought the virulent poison was driven from her system. It was but dormant, however, and soon appeared with all its horrible features. None could be secured to attend the sick woman, save self-sacrificing sisters of charity from Chicago. Her agony extended over a period of nearly three years, and death was finally a welcome release."

Bitten by a Mad Horse.—The following report comes from Michigan: "A case of alleged horse hydrophobia exists in the township of Greenfield, Mich. A week ago Richard Reed was bitten by a favorite horse which had been sick and had become vicious. The wound was cauterized after Veterinary Surgeon Murray had pronounced the horse afflicted with rabies. Reed at once had the horse killed. The spinal cord was secured and two white rabbits were inoculated with the virus, and several dogs trepanned and clots of the cord laid on their brains. Reed is a wealthy farmer and is wrought up to a high pitch. He at first decided to wait five days to learn the result of the experiments begun, but changed his mind, and will start for Paris at once to consult Pasteur. Reed is fifty years old."—*Nat. Live Stock Journal.*

Quarantined Horses.—Word comes from De Witt County, Ills., that "the horse disease known as '*maladie du coit*,' that caused such excitement among our stockmen and the assemblage of learned veterinarians from several States, and a session of a part of the live stock commission at Clinton, was the occasion to-day of another official visit of Mr. J. M. Pearson, chairman of the commission, from Alton; C. T. Johnston, secretary, from Springfield, and Dr. Williams, of Bloomington, Assistant State Veterinarian. Out of a list of 200 under quarantine they have examined nearly 30 mares, ordered one stallion killed this morning, but will delay the alleged cases longer before ordering any more killed. The disease is abating, as there are but few new cases, and it is thought they can, under the rigid regulations, be soon stamped out. The commission will visit cases in Wapella to-morrow."

Spaying Heifers on the Ranges.—Spaying heifers in the west is still going on. Nevada leads in the matter, but Idaho, Utah and Wyoming have done considerable of this unsexing. Texas, also, has spayed large numbers. This process will increase the beef output two years hence, but later on it will cause a heavy deficit. It looks now as if the practice would be continued in order to prevent the over-crowding of the ranges. Spaying increases the hardiness of the animal and makes the heifer stock even better rustlers than the steers.—*Nat. Live Stock Journal.*

American Veterinary Review,

FEBRUARY, 1888.

EDITORIAL.

Professional Ethics in Our Colleges.—The subject opened by the *Medical Record*—the need for such education is evident more in veterinary than in human medical colleges—its importance to the young veterinary graduate—advice that he needs—how will he enter into professional life?—it is more by didactic advice than by reading that deontology can be learned—if properly carried out, it will do away with many of the unprofessional acts and quackeries of all kinds that the recent graduate, and even the old practitioner, is liable to fall into—it will be a means of elevating the profession. Dr. Gadsden on Pleuro-Pneumonia.—The manner in which he claims to have been treated at the Consolidated Cattle Growers' Association—the paper he had prepared, ignored—his opinion as to the contagiosity of the disease sustained by some English authorities—an important observation—the effect it may have in the process of stamping the disease out of this country. American Veterinary Review Prize.—Our disappointed enthusiasm about the selection of the committee—well declined and warmly accepted—the committee is carefully selected and nominated, anyhow—our thanks to the gentlemen who accepted it—we are now ready to receive the papers—may many come. Patho-Biological Laboratory in Nebraska.—A good offer from Prof. F. S. Billings—it is already accepted and taken advantage of by veterinarians. Editorial Notices.

Professional Ethics in our Colleges.—Our respected contemporary, the *Medical Record*, in some recent editorial remarks, discusses the existing need in our medical colleges of better teachings in respect to medical ethics. It is not so much of instruction in right conduct, as regards the ordinary relations of life, such as the need of honesty, purity, generosity and the other major virtues, that he speaks, but of the rules and observances which constitute technical ethics, established courtesies and the minor morals, manners and conducts of professional life.

The pressing need of such an education must be evident also, in our own profession, and especially in veterinarian circles on this side of the Atlantic.

It needs but little observation to discover how little the average veterinary graduate knows of the finer observances of true conventional courtesy toward other members of the profession which he has adopted, or towards his colleagues, his patrons, his patients or his fellows in any sense. Indeed, how many of the elders of the profession are competent to become the mentors of their junior brethren in the conduct of life generally?

An immediate want of the young graduate who has just received his diploma is his card. In what style does he intend to have it printed?—here is a formidable question. He is about to make a start in practice; to enter into the imminent fight for a useful and successful career. How shall he announce himself? What shall be his first step in veterinary life? He is about to meet with older practitioners: what is going to be his reception from them, and what must be his deportment toward them? Consultations will take place over serious cases; what are his respective duties when he is the party consulting, and what when the party consulted? Questions of principle touching methods of living, of policy, involving questions of conscience and integrity, the demands of reputation and honor; habits of frankness or of deception—these questions must be daily encountered and disposed of—how will he know the right way and adhere to it; how shall he detect the wrong way and avoid it?

As the Editor of the *Record* says: "professional deontology is of as great importance and value in the education of the veterinarian as of the human physician;" and as the training of our veterinary rising generation by formal conventionalities and written rules is an innovotion not to be expected if, it is, indeed, to be desired, the duty naturally and properly devolves on the teachers, whose influence is supposed to be, and ought to be, if not paramount, at least powerfully salutary and positive on the side of whatever rules and observances, either implied or codified, that shall tend to the tempering and polishing of the habits and manners of GENTLEMEN of any profession. And it is only when sug-

gestions such as these shall be realized, and such a course inaugurated, not by a long series of didactic lectures, but by good, practical, honest common-sense counsel and example, that we shall see the last of the pompous business cards; the engraved advertisements; the manufactured newspaper notoriety; the stealing of patients; the discrediting and disparaging the names of colleagues; the assumption of false titles and degrees; the bombastic display of diplomas; the pretense of transcendent skill in deceptive specialties, and so on, and so on, *ad nauseum*.

These things and such as these, are to-day the opprobrium of our profession, (as of sundry others) and tend more or less to smirch the good name and soil the honorably-acquired repute which belongs to the upright, intelligent, conscientious, skillful and trustworthy GENTLEMANLY VETERINARIAN.

Our remarks are desultory and hasty and might be bettered in the arrangement, but they will be understood.

DR. GADSDEN ON PLEURO-PNEUMONIA.—That the subject of pleuro-pneumonia has been considered, debated, discussed and reviewed to the verge of exhaustion if not, indeed, a little beyond it is a fact in veterinary literature of which no veterinarian can be ignorant. On this continent it would seem that no assemblage of persons can be convened for any purpose connected with cattle-questions, and composed of cattle owners and breeders, where the smallest opening can be found for the discussion, in which it does not find its place; and it makes it a large one, for dissertation and inquiry. It is always in order, and even if it were not so, would compel attention, *nolens volens*, if no otherwise. And it would be vain to attempt to disparage the interest or belittle the importance of the subject.

At a recent meeting of the Consolidated Cattle Growers' Association, which also included a number of veterinarians, the subject of pleuro-pneumonia had, of course, a place on the programme of the proceedings.

The Bureau of Animal Industry was well represented by its chief, Dr. E. Salmon and others, and several other veterinarians were present, among whom was Dr. J. W. Gadsden, who for several years past seems to have devoted the greater part of his

professional attention to the subject of the bovine lung plague, and who was desirous of expressing his views. He had a paper on the subject, in the preparation of which he had taken considerable pains.

Dr. Gadsden, for some reason, which has not been made known to us, and which he believes consisted in the nature of the facts which he had gathered, and which, though sustained by his own observations, were not acceptable to those present, failed to obtain permission to read the paper he had offered, and consequently no discussion of his views could be had.

These statements, and the theory involved in them, communicated to us by the Doctor, are, we believe, of sufficient interest to lay before our readers. If, as the Doctor contends, sustained by the opinion of such high English authorities as he has named, the contagion can only be communicated by contact with the living diseased animal, the sanitary regulations for the eradication of the disease will become considerably simplified, and the possibility of its extermination throughout the country almost become an established future event. The observations of Dr. Gadsden, and of Professors Williams, McCall, Walley and others ought not to be ignored and certainly those who have had as large a connection with the work relating to pleuro-pneumonia in the United States, for the last eight years, as Professor Law, Dr. Salmon, Professors McLean, Michener, Dr. Wray, and others, have had sufficiently abundant opportunities to observe the various modes of infection, to enable them to refute from their abundant experience, the theories of those who hold with Dr. Gadsden that the living subject of the disease is about the only efficient agent of its dissemination. The discussion and re-adjustment of a question involving interests so extensive in a manner so revolutionary, if it is indeed to be so re-adjusted as to land us so far from the position held at present, is a matter of great importance and should be gravely considered.

The subject of pleuro-pneumonia occupied much of the time at the last International Veterinary Congress, held in Brussels in 1883, and the idea was generally admitted that the living animal was not the only agent existing for the emission of the virulent principle, but that it might also emanate from the cadavers

or from the tissues which formed the seat of the symptomatic lesions of the disease, and also from many other sources of diffusion. How wide the divergence between Dr. Gadsden's views and these!

American Veterinary Review Prize.—We suppose that our readers, as well as all other members of the veterinary profession in the United States, are aware of our offer, published in our December issue, of a special prize for the best original paper furnished in competition, for publication in the Review, the premium to be awarded upon the verdict of a committee of five veterinarian practitioners, to be selected from the ranks of the profession in the United States at large.

In the simplicity of our enthusiasm we were led to believe that our object would be so immediately appreciated, and we should so promptly awaken the generous sympathies of our brethren, that the process of obtaining the necessary jury, as in some of our current exciting criminal trials, would be one of rejection rather than of selection, and might involve the danger of seeming to slight a few of our good friends by making some more or less invidious distinctions in excluding them from the committee; and so we have trembled, somewhat, over our apprehended *embarrassment du choix*, as we have thought the thing over. We wanted barely five men, out of all the veterinarians in the country (leaving out, of course, the crowd of intending contestants, whose number we refrain from attempting to estimate), barely *five men*, willing and consenting to respond to our appeal for co-operation and help by contributing the weight of their reputation and influence in behalf of a measure which could not well fail to benefit the profession of their choice, with but a trifling expenditure of time and thought. And so we opened a correspondence with certain of our colleagues, with an expectation of being soon able to announce the composition of our committee of selection. Then we began to discover the extent to which we had erred in failing to count on the wonderful facility with which, under the most plausible of pleas, such a request could be declined and evaded. In some cases the declinations were conveyed in terms so nicely chosen that it was almost a pleasure to be disappointed and

refused, and sometimes our appeal has not been so much as recognized (unless our failure to receive replies is due to our neglecting to apply to the dead letter office).

But all this matters little or nothing now. We have offered the prize, and the prize is still offered, and we have a committee, and it is the right kind of a committee. And in announcing its composition we take sincere pleasure in tendering our truest thanks to the gentlemen with whom we shall co-operate in the matter in hand. They are gentlemen whose names and standing will be sufficient to give value to whatever opinions they may unite in expressing. Our appreciation of their kindness in accepting our invitation to become judges in the matter is enhanced by the difficulties we have encountered, and their colleagues at large should honor them for their professional devotion and disinterested service.

Here are their names: Prof. R. Huydekoper, of the Veterinary Department of the University of Pennsylvania, as chairman; Dr. J. C. Myers, Sr., of Cincinnati; Dr. A. A. Holcombe, State Veterinarian of Kansas; Dr. L. Howard, of Boston, and Dr. D. J. Dixon, of Hoboken, New Jersey.

We are now prepared to receive the competing papers, and once for all beg to repeat the conditions of admission to the contest: The papers are to be delivered to the Review before the first of April, 1888; each paper is to be distinguished by a special motto, and accompanied by a sealed envelope enclosing the name and address of the author, and endorsed externally with the distinguishing motto for identification.

The decision of the committee will be made public as soon as it shall have reached the editorial rooms of the Review.

Patho-Biological Laboratory of Nebraska.—In the Review for January we published a letter from the Director of the Patho-biological Laboratory of Nebraska, in which the facilities of that institution were liberally placed at the disposal of such graduated physicians and veterinarians as might desire to pursue a course of study in that special department of scientific research. Such an offer is characteristic of Professor Billings, and is no less than we should expect from that source, and we are glad to hear that

advantage has already been taken of his offer, and that he has a number of students profiting by his instructions. The Doctor is well equipped for the difficult work of biological investigation, and we are sure that no one who follows his teaching can fail to receive benefit and gratification.

Notices.—We would be thankful to any of our friends who may have duplicate numbers of the issue for July, 1887, if they would kindly return them to us.

As we are approaching the end of our eleventh volume, we beg to ask our readers to inform us of their desire to continue their patronage by renewing their subscriptions promptly. We also request those who have failed to remit the amount of their dues, to do so at once by sending a post office order to *Station G.* In complying with these suggestions, our friends will assure themselves a prompt delivery of their journal.

ORIGINAL ARTICLES.

FOOT-AND-MOUTH DISEASE

AS IT AFFECTS MAN AND ANIMALS, AND ITS RELATION TO HUMAN SCARLATINA AS A PROPHYLACTIC.

Also, Remarks upon the Transmission of Human Scarlatina to the Lower Animals, and the Use of Virus thus Cultivated as a Preventive Agent.

By J. W. Strickler, M.S., M.D., Orange, N. J.

(*Continued from puge* 450).

Believing, however, that in the evidence furnished by the "Dover epidemic" there was an indication of what might possibly be accomplished by the use of the virus of foot-and-mouth disease as a preventive of human scarlatina, I made further experimental investigation, as follows:

With some virus (contents of vesicles) taken from cows having a mild form of foot-and-mouth disease, I inoculated three children, and subsequently exposed them to scarlet fever contagium. The histories given briefly will show the results:

Case I.—M. M——, about eight years of age; had never had

scarlet fever. On January 12, 1884, I injected under the skin of his arm a small quantity of the virus. A short time thereafter the cervical lymphatic glands became enlarged and tender to the touch. There was no marked systemic disturbance, neither was there any sore mouth or throat. All signs of glandular enlargement and tenderness had disappeared in six or seven days. He was then taken to a house in which there was a boy sick with scarlet fever. The disease was in the desquamating stage and the throat still sore. His parents being poor, the pillow upon which the patient lay had not been exchanged for a clean one since the beginning of the sickness. This pillow was placed over the face of the boy who had been inoculated, and held there some time. He was then made to inhale the breath of the patient, and afterward to remain some time in the sick room. The boy did not develop scarlatina after having been thus exposed, neither has he contracted the disease since, although there has been opportunity for infection.

Case II.—B. P——, aged four years; had never had scarlatina. On March 6th I inoculated her in the arm (hypodermically) with a small quantity of the foot-and-mouth virus. On 13th her temperature rose to 103° F. Her mouth was sore, without showing any vesicles, and she complained of a pricking sensation in her throat. She had slight headache, the appetite was impaired, and she was quite peevish. There was no eruption at any point on the body. By March 20th she was well. She was then taken to a house where I had a patient in the desquamating stage of scarlet fever. The patient was very sick at the time because of complications; indeed was so ill that I felt somewhat doubtful about the issue. The same plan of exposure was adopted as in the first case, although I could not succeed in getting the inoculated child quite near enough to the patient to inhale her breath; but the "pillow exposure" and the length of time she was in sick room afforded a good opportunity for infection. She did not subsequently develop scarlet fever.

Case III.—J. M——, aged ten years; had never had scarlatina. I inoculated him just as I did the first two. He did not afterward develop any systemic disturbance or local lesion. After a

lapse of three years, with opportunity for infection, he tells me he has not had scarlatina.

The results thus obtained, especially when taken in connection with the data furnished by the statistical table, seem to furnish some reason for believing that, for a time at least, the virus of foot-and-mouth disease is protective against the contagium of human scarlatina. But I am well aware that at this stage of the investigation conclusions cannot, ought not to be advanced, and until further information can be obtained by careful experimental investigation, nothing absolute or positive should be said concerning the practical issue above alluded to. While foot-and-mouth disease, as it affects man, is in many respects the exact counterpart of the disease as it occurs in cattle, yet there are certain points of difference, and in order to make them apparent a brief description of the latter affection will be given. The disease (as it affects cattle) may be defined as a very contagious and infectious affection, characterized by an eruption of vesicles or blisters in the mouth, on the internal surface of the lips, sometimes in the nostrils, on the teats and udder, between the pedal digits and around the coronets, and sometimes in the lactiferous ducts. It passes through four different stages, viz.: fever, eruption, ulceration, desiccation and desquamation. The symptoms of these four stages or periods are as follows:

First Period.—Before any perceptible alteration has taken place in the ordinary habits or condition of the animal, the thermometer indicates an increase of temperature, which generally ascends to 102°, and as high as 104°, or even 107° F., in from one to two days, and does not descend to any extent until the end of the eruptive period. The next indication is dullness, inappetence and slight shiverings. The muffle becomes warm and dry, the eye is tearful, and the mouth hot and inflamed-looking in places, and frequently sore when handled, the membrane being covered with viscid mucus, which flows in stringy masses from the lips. There is grinding of the teeth, and a smacking or clicking noise; the breath has a fetid odor; rumination ceases, and the prehension, and often the deglutition of food is painful; the animal preferring to dabble its mouth in cold water. Not infrequently,

when the feet are beginning to inflame, the animal stands uncomfortably, drawing the limbs together, or jerking them up suddenly under the body, arching the back, and pawing; the movements are reluctantly performed, and the coronets hot and sore. There is also slight constipation, and, if with a milch cow, the secretion of milk is gradually diminished, and that fluid assumes a yellow tint; in the majority of cases it is nearly or altogether suspended. *The udder becomes red and tense* when it is involved, and the teats swollen and painful to the touch. This stage usually lasts from twenty-four to forty-eight hours, according to the intensity of the fever.

Second Period.—After the time above mentioned the eruption begins to appear in those parts which are to be its seat, and the fever commences to abate in many cases. When the mouth is chiefly affected there are seen on its lining membrane, and particularly on the upper lip, gums and sides of the tongue and palate, white or yellowish-white blisters, the size of a grain of millet to that of the size of a pea or nut, their form being very irregular. Sometimes they are discrete, or scattered over the surface; in other cases they are confluent, collectively forming patches which are at first gray or yellow, and afterward white; slightly convex; each vesicle is usually circular; the smallest are seen on the muffle. In the mouth they are largest, and most frequently confluent; bnt there they only exist for a brief period, the friction caused by the movements of the tongue tearing them; the epithelium is detached in flakes of variable dimensions, leaving unhealthy ulcers or denuded spots, or "erosions" of a bright red tint, which contrasts markedly with the gray hue of the surrounding surface. These shreds are often seen adhering to the border of these sores; and if on the tongue, that organ is kept continually moving to get rid of them, and the animal emits a smacking sound with its lips. At this stage of the disease the papillæ of the tongue are congested and prominent. Where there is no friction the vesicles do not rupture within one or two days. On the udder the vesicles are somewhat different. *The teats are most frequently their seat*, and it is not unusual to find the phlyctenæ grouped in a circle around their orifice; when isolated on the surface of the

organ they are surrounded by a pale-red circle, and when confluent they are very irregular and variable in number. In the case of a cow the alteration of the milk is very striking. It coagulates on being boiled, or when its temperature is only slightly raised. It also becomes yellow in color and acid in reaction.

When the limbs are affected the heat and redness of the coronet are most noticeable toward the heel and interdigital space of one or more feet. The coronet swells; the animal is lame, and prefers to maintain a recumbent position. In one or two days the vesicles are developed at the points indicated, most frequently earliest in the intedigital space; at first they are small, but they increase in size until they are as large as a bean or small nut, and extend round the claws, often becoming confluent, the contents appearing as a yellow limpid fluid. The skin of the part assumes a bleached aspect, and is soon covered with a kind of cheesy matter, resulting from the inspissation of this fluid, which emits an ammoniacal odor. In some cases the skin around the base of the horns becomes inflamed at the same time as that of the mouth or feet, and the horns are loosened. Occasionally, also, a vesicular eruption manifests itself at the orifice of the vagina, at the perineum and anus, or in the nostrils; and it sometimes happens that the eyes are affected, the conjunctival membrane becoming inflamed and suppurating, and phlyctenæ forming on the cornea. There may also be nasal catarrh and symptoms of gastric derangement.

Third Period. This is the aphthous stage of the disease, and begins when the vesicles have ruptured, and the epidermis being removed, erosions appear. This does not occur everywhere at the same time, but varies according to the region. In the mouth it soon occurs, owing to the movement of the tongue, and also in the feet by that of the claws. On the udder it is later, seldom occurring before thirty-six or forty-eight hours; or if the disease is benignant the vesicles on this organ may not rupture at all, their contents becoming absorbed, and the pellicle of epidermis covering them scaling off when cicatrization has taken place beneath. When the vesicles do break, there remains a little, bright-red sore, which is smooth or granulating, and is soon covered with

a fluid pus mixed with epithelial cells, which in drying forms a thin reddish crust that protects the erosion until it heals. In the mouth and on the lips the vesicles are broken almost as soon as formed, leaving circular or irregular bright-red sores which bleed readily, their rupture being indicated by dribbling of saliva streaked with blood,

It sometimes happens that when the tongue is seized to explore the mouth, large patches of epidermis come away in the hand, as if the tongue had been boiled. In some rare cases an exudation of yellow color and cheesy consistency is observed toward the root of the tongue, due to epithelial proliferation.

The fever has greatly subsided, but the thirst is intense, and the animal eagerly drinks water or gruel, though, owing to the soreness of the mouth, it can eat but little, especially if the food be dry and hard; consequently the loss of condition is rapid.

Fourth Period. This is marked by the desiccation or drying up of the aphthæ, and the formation of new epidermis. The crust falls off, and new epidermis or epithelium appears as a thin lead-colored pellicle. There is also at this time a general desquamation of the cuticle, and this is invariably the case. There is also a good deal of itching of the surface (Walley). With the completion of these processes all traces of the disease disappear. There is no lameness, the appetite has returned, and the former condition is being restored; while the secretion of milk, which may have been greatly diminished—perhaps to less than one-third—becomes augmented, and regains its normal properties.

Bollinger states that "in animals which have once acquired the disease the susceptibility ceases for a considerable period, or at least becomes very slight. Repeated attacks of the malady in the same animal are, upon the whole, rare." That the susceptibility ceases for a time has been demonstrated by Dr. E. Klein, of London, England. He inoculated five sheep with active cultivations of the micrococcus, but without producing any definite local or general lesion. "Subsequent feeding of these same sheep with the active micrococcus had no result." From this he argues that a previous subcutaneous inoculation with the micrococcus provides the animals with immunity against the disease. Dr. Klein also claims

to have discovered the germ peculiar to this disease. His method of investigation was as follows: He inoculated alkaline peptones, broth, and solid agar-agar, peptone broth mixture, solid nutritive gelatine mixture, and milk, with lymph which was obtained from the vesicles of diseased sheep. He discovered after a few days, a thin film, limited in extent, npon the surface of the solid media at and near the point of puncture. The film gradually spread, presenting a very characteristic appearance, namely *a collection of closely packed minute granules* or droplets. These enlarge slowly and gradually, and become whitish and translucent in character. If the point of a needle or platinum wire be moistened with the lymph and pushed into the solid medium, the line of puncture becomes marked as a linear aggregation of minute granules or droplets after several days or weeks. There is also, in addition to this, on the surface of the culture media the film of granules already alluded to, which starts from the point of inoculation. This micrococcus grows very slowly, the first indication of its growth in solid nutritive gelatine mixture, at a temperature of 18° to 22° C., becoming visible under a lens at the end of from five to eight days, or still later. The growth thus developed appears in the form of a small cluster of transparent granules. In agar-agar mixture, kept at 35° to 38° C., the growth is sooner visible, although, after six or seven months, "in all media and under all conditions the growth remains of limited extent." When milk is inoculated with the micrococcus, and kept at a temperature varying between 35° and 38° C., the growth is found to progress very slowly. The condition and natural appearance of the milk are not changed. No curdling occurs, but the reaction becomes acid. The micrococcus forms in artificial media dumb-bells (diplococcus) and beautiful chains (streptococcus). These vary in length according to the number of micrococci composing them, "the short chains being a linear series of four, six or eight micrococci, the longer ones of more than eight up to thirty and more micrococci." The longer chains are always curved, and even convoluted.

The above mentioned characteristic appearance of the growth is owing to the presence of smaller or larger masses of chain mat-

ted together. Subcutaneous inoculation with artificial cultivations produces no perceptible disorder, but by feeding sheep with a twentieth generation the typical disease has been reproduced, viz., vesicles and ulcerations upon the feet. From the vesicles of such animals lymph was obtained which, on cultivation, yielded the same micrococci, characterized by the same slow growth and the same typical appearance as those used for the experiment. Dr. Klein claims, therefore, that there can be no question about the identity of this peculiar micrococcus with the cause of the disease.

The description thus given of the mode of growth and appearance of the micrococci of foot-and-mouth disease does not materially differ from that given, by the same investigator, of the micrococci found in the ulcers of cows affected with a disease which has since been determined to be cow scarlatina. For the sake of instituting a comparison, I will quote his own words with reference to the cultivation and appearance of the bovine scarlatinal streptococcus.

"From the deeper parts of an ulcer of cow IV. (one he had under observation) material was obtained, with which tubes containing either solid nutritive gelatine or agar-agar mixture were inoculated. After some days, and in both media, a micrococcus appeared, the growth of which was extremely characteristic. These are its characters in the nutritive gelatine: After three to six days' incubation at 20° C., the growth made its appearance at the point or line of inoculation, in the form of small points or granules, whitish in color, and tolerably closely placed. During the next few days their number and size increased. At the end of a fortnight the line of inoculation was visible as a streak of whitish granules or droplets, some large, others small, more or less closely placed. On the surface of the gelatine the growth, like a film of granules, spreads slowly in breadth, but even after months remain small. When inoculated into the depth of the gelatine the channel of inoculation becomes visible as a whitish streak, made up of smaller and larger droplets. The gelatine is not liquefied by the growth. The same characters are assumed by the growth in agar-agar mixture, and in solid serum. The general aspect of the growth in gelatine, in agar-agar, and in serum, is very

similar to that presented by the streptococcus of foot-and-mouth disease, but with this difference, namely, that in gelatine tubes the streptococcus of foot-and-mouth disease is a little faster in its growth, and its component granules are a little more distant. Nevertheless, I have tubes of both kinds of organisms in gelatine, and in agar-agar tubes, which cannot be, from their general appearance, easily distinguished. In faintly alkaline broth, or in broth and peptone, the micrococcus of the cow ulcers grows readily, and in the same manner as that of foot-and-mouth disease. But there is one test by which the two kinds of organisms can be very easily distinguished: the streptococcus of foot-and-mouth disease, when grown in milk, does not affect the fluid character of the milk, whereas milk inoculated with the organism obtained from the cow ulcer, will, if kept for two days in the incubator at 35° C., have been turned completely solid. This difference is a very striking difference, and a few days growth in milk suffices for distinguishing without fail between the two. The microscopic examination of a culture in broth peptone, in gelatine, or in agar-agar mixture, shows that the growth consists of spherical micrococci, arranged as diplococci, and as shorter and longer, straight, wavy or curved chains—streptococcus—these latter sometimes of great length.

As regards the shape of the micrococci, the mode of their division, the branchings of the chains, the presence here and there in the chain of a large element among the smaller ones, the organisms of the ulcers hardly differ from the description which I am preparing of the streptococcus of foot-and-mouth disease."* It will be observed that the only point of real difference is the effect the growth of the streptococcus of the cow ulcer has upon milk, solidifying it, while the streptococcus of foot-and-mouth is asserted not to produce this effect. In connection with this point the following may be quoted: "But there is one point, in which, so far as I know, it (the milk) differs from all other milk, and that is in its coagulation on being boiled, or having its temperature only slightly raised by being mixed with hot gruel," etc. (*Edin.*

* Report on Milk Scarlatina to the Local Government Board, by Dr. E. Klein, London, England, 1886.

Med. Journal, 1863, p. 711.). "It is a very general opinion among continental veterinarians that, when the milk can be boiled without coagulating, it is no longer dangerous to use; and Hilderbrandt, in Magdeburg, expressly states that he never observed a single case of injury to health from the use of milk which had been boiled without coagulating." (*Gurlt u. Hertwig's Magazine*, vi., p. 179).

It is certainly true that the two diseases ("foot-and-mouth disease" and the "Hendon cow disease") are very similar in some of their clinical features. This will be made manifest when the mode of development and subsequent history of the vesicles which are characteristic of the two diseases shall have been compared. In the following notes some points of similarity between these two affections may be incidentally noted.

When at Deering, Me., some time ago, for the purpose of studying foot-and-mouth disease in cattle, I saw one or two cases which could very easily have passed for "bovine scarlatina," as described by Drs. Klein and Cameron. The vesicles and ulcers upon the teats and udder were the exact counterpart of the word-picture of those seen upon the Henden cows' udders and teats.

Just here I may say that during the last four years I have been endeavoring to determine: 1st, Whether scarlatina can be generated in the lower animals by inoculation with human scarlatinal virus; 2d, if so, whether such a disease is mild in character; 3d, whether virus furnished in such a manner could, by inoculation, be used as a means of preventing the development of scarlet fever in human beings.

To determine the truth concerning the first inquiry I obtained some blood from a patient who had scarlet fever, and injected thirty drops of it into the right jugular vein of a colt about one year old. I also introduced under the skin of the thorax a blood-clot obtained from the same patient, and caused the colt to swallow about two drachms of pharyngeal mucus. This occurred on May 1, 1883. The temperature gradually rose from $101\frac{1}{4}°$ F. (the temperature of the colt before inoculation) till it reached, on May 12th, $102\frac{1}{5}$ F. During the following night the colt lacerated the skin of the chest to a small extent, and immediately thereafter

the temperature began, or continued to rise till it reached 103½° F., at 8 p.m., May 13th. The temperature then began to fall, till it stood at 101¼° F., May 16th, at 3 p.m. During this time the intermaxillary glands became enlarged and sensitive, the mucous membrane of the nostrils and eyes injected, and from the nostrils there was a discharge of ropy mucus. Thinking that the injury received on the 12th might have interfered with the natural action of the virus by causing a local inflammation and a general rise of temperature, and wishing, if possible, to intensify the effect of the first inoculation, I injected into the jugular vein some pharyngeal mucus from two well-marked cases of scarlatina. The result was an increased redness of the mucous membranes of the nose and mouth, and a mild sore throat, which disappeared with fading of the redness of the mucous membranes. The symptoms above given almost entirely disappeared by May 24th. There was no subsequent œdema of the extremities or sheath, nor was there any desquamation of the cuticle.

On June 28, 1883, I enveloped the head of a perfectly healthy colt in a bag containing a chemise which had been worn by a scarlet fever patient. This I allowed to remain adjusted about seventy-two hours. On July 2d I injected into the left jugular vein, and into a vein in the leg, some human scarlatinal blood. Within forty-eight hours the temperature began to rise, the colt became less active, showing a tendency to remain quiet. On the sixth day (July 8th) she began to cough and swallowed with difficulty. The visible mucous membranes were quite red, and at certain points had somewhat the appearance of the mucous membrane of the pharynx in man when affected with scarlet fever. The intermaxillary glands were enlarged and sensitive, and, when the throat was pressed upon, the colt evinced uneasiness. There was a discharge of tenacious mucus from the nostrils. The pharynx was unnaturally red. On July 9th I introduced some epidermal scales, obtained from a scarlet-fever patient, under the skin of the abdomen, but so far as I could determine they produced no effect. In this case there was a desquamation of the skin at a few points where I had not previously seen an eruption.

In both colts there followed the inoculations, sore throat

ness of the mucous membranes of the nostrils, mouth, and pharynx, elevation of the temperature above normal, and in one, desquamation of the cuticle. It seems reasonable, therefore, to believe that a specific disease was produced in both instances, and that the specific disease was scarlatina. Since that time I have inoculated rabbits, dogs, guinea-pigs and cattle with human scarlatinal matter, and have obtained some very gratifying results, especially in cattle. In May, 1883, I inoculated a calf with human scarlatinal virus by injecting into the general circulation some blood taken from a well-marked case (a young man with a typical eruption on neck, chest, abdomen and limbs), and by subcutaneous introduction of the blood into the abdomen. After the lapse of a few hours the skin at and near the point of inoculation (abdomen) became uniformly reddened. The elevation of temperature was very slight. The redness and sensitiveness of the skin increased until May 24th, when I discovered pus at the centre of the area of redness. The temperature at that time was $102\frac{1}{5}°$ F. The visible mucous membranes were not affected. Recovery complete by Jnne 1st.

Knowing that cows recently calved were supposed to be especially susceptible to scarlatinal contagium, I procured one that had aborted about one week prior to the time of purchase. I inoculated this cow in the udder with some pharyngeal mucus taken from a patient sick with scarlet fever. The day following the inoculation the temperature rose to 102° F.; pulse 48. On the third day the temperature was $102\frac{3}{5}$ F.; pulse 56. The temperature then began to descend till it reached $101\frac{1}{4}°$ F. on the eighth day. During this time a cough developed, and it was noticed that the animal did not swallow with the same readiness as usual. At the point of inoculation had developed a superficial vesicle, which very soon became filled with purulent contents. Still deeper in the tissues a small abscess formed, which, after discharging its contents remained open, discharging a small amount of pus. The skin around the seat of the vesicle and abscess was quite intensely reddened. The temperature gradually declined, till finally, on the nineteenth day, it fell to $100\frac{1}{4}°$ F. There was a desquamation of the cuticle near the abscess where the skin had been reddened,

The next cow I inoculated was in the third or fourth month of gestation. The inoculation was made in the udder, and with pharyngeal mucus from a typical case of human scarlatina. Twenty-four hours after the inoculation the temperature began to rise, although slowly. On the second day the thermometer showed a temperature of 101½° F., and it did not vary from this point till the seventh day, when it fell to 100° F. During this time the udder became reddened, swollen and tender, and finally suppurated at the point of inoculation. After the pus, which was small in quantity, was allowed to escape, the cavity of the abscess continued for a few days to discharge pus and then gradually healed. There was no sore throat, nor alteration of the mucous membranes. The reddened integument of the udder around the abscess desquamated. A subsequent inoculation of this cow with human scarlatinal virus produced no effect.

I next inoculated a calf with pharyngeal mucus and epidermal scales derived from scarlatinal patients. The inoculation was made in the abdominal region. At the point of inoculation there very soon appeared a vesicle about as large as a lima bean, which was at first quite clear, but later became filled with sero-purulent matter, and then became yellow in appearance. Coincidentally with the development of the vesicle there was an elevation of temperature, and the appearance of an intense reddness of the skin for some distance from the point of inoculation. There was no sore throat. As I wished the contents of the vesicle as a virus with which to inoculate some children, I punctured it, collecting the fluid in a small bottle. After being punctured the vesicle became converted into an ulcer, which gradually healed. The skin near this vesicle desquamated after the redness disappeared. I am led to believe, as a result of what I have seen while experimenting thus with cattle, that it is possible to infect them with human scarlatinal contagium.

To answer the second question, I may say that, so far as my experience serves me, the lesion produced in the lower animals by inoculation with human scarlatinal virus is a mild one. I am aware, however, that it *might* be otherwise.

In a recent letter, Dr. E. Klein, of London, England, whose

reputation and skill as an investigator place him very high in our esteem and confidence, tells me that cows inoculated with scarlalinal micrococci of human source become affected in *precisely* the same manner as the Henden cows had been. The disease he refers to has the following characteristics, viz.: Upon the teats and udder vesicles or bullæ appear, from five to seven days after the commencement of the disease. In number they vary from two to four on a teat, and range in size from a pea to a horse-bean, and contain as first a clear fluid. The first vesicle frequently appears between the two fore teats, close to the abdominal vein. These vesicles usually become broken in milking, leaving raw sores, sometimes red, in other cases pale in color, with raised, ulcerated-looking edges. Shortly after the vesicle becomes ruptured a brown scab forms upon the sore. A thin watery fluid exudes from under the scab. The skin about the eyeballs is puffy, and is said to present a minute red eruption or rash. There is also an eruption on the hind-quarters. This eruption in its later stages consists of patches of eczematous-looking crusts, which, when picked off, leave a raw, moist sore. The hair comes away with the scab. There is no pitting of the skin. There is sometimes a discharge of yellow matter from the nostrils and eyes. The fever is moderate. Sore throat is said to occur in severe cases. The bowels are loose in very acute cases. There is a dry, husky, irritative cough, with bronchial rales and quickened breathing in some cases. In December, 1885, it was reported that a sudden and extensive outbreak of scarlet fever had occurred in South Marylebone, and that it appeared to be associated with the distribution of milk from a particular retailer. It was afterward discovered that the milk was obtained from cows affected with the disease just described. There were in all about one hundred cases of scarlet fever caused by drinking the infected milk. If, then, it be true that the Henden cows furnished a contagium which caused the development of genuine scarlatina in about one hundred persons, it must be true that the cows had scarlatina; and again, if the inoculation of cattle with human scarlatinal virus produces a disease identical with the Henden cow disease, it follows that scarlet fever can be generated at will in susceptsble animals.

I have found that results I obtained in several instances are greatly strengthened by the recent experimental investigations of Dr. Klein as to the nature of the Henden cow disease, and its connection with the outbreak of scarlet fever at South Marylebone and in a certain district in London. The vesicles upon the udder of the cow and the abdomen of the calf already alluded to, as well as the general course of the disease, as occasioned by inoculation with human scarlatinal virus, correspond with the description of the disease as seen in England.

The answer to the third and most important question may perhaps be suggested in what follows:

In the early part of the year 1883 I inoculated twelve persons with virus obtained from horses supposed to have scarlatina. Since that time not one of that number, so far as I can learn, has had scarlet fever. These twelve persons were also inoculated with human scarlatinal blood after they had been inoculated with equine virus. During the summer of the same year I inoculated thirteen children, all of whom had been, and were at the time of inoculation, exposed to the influence of air contaminated by the breath and exhalations of scarlatinal patients. Five of this number escaped, the remaining eight developed the disease (scarlatina) very soon after inoculation, in one instance within five hours. Four of the eight cases had no angina, but simply the eruption, with slight disturbance of the stomach. They were not confined to bed one hour. None of the cases were severe.

During the last year I have inoculated two children with the contents of a vesicle produced in the abdomen of a calf by inoculation with virus derived from a patient who had scarlet fever. The notes of the first case are furnished by Dr. Stubbert, of Bloomfield, N. J., who watched the patient from day to day after the inoculation. "On April 25th the child was inoculated in the left arm with scarlatinal matter taken from a calf. On the 27th an erythematous blush appeared about the scarification. By the 28th the blush had disappeared, but a scab had formed, and around its puffed-up border there was a red areola. On April 30th the child had quite a high fever. On May 1st there appeared on the upper part of the chest a rash similar to a scarlatinal rash. On

May 2d the scab came off. The rash which began on the chest spread to the arms. On May 3d the rash was less bright, and on the right shoulder there was evidence of a slight exfoliation of the skin. In three or four days after this the child was restored to perfect health." The second child was inoculated in the presence of Dr. Stubbert, who kindly permitted me to test the virus not only in this, but in the previous instance. The only result I obtained in this second case was a slight erythematous blush, which, after existing two or three days, gradually disappeared. There was no systematic disturbance. With scarlatinal virus modified by transmission to the cow, I inoculated two other children, producing in them a distinct local lesion. These children have not since developed scarlet fever, although the disease has existed in their immediate neighborhood, and they have been more or less exposed to its influence. While the subject-matter of this paper thus presented to you does not furnish a positive answer to the question, "Can we prevent the development of scarlet fever by the use of virus obtained in one of two ways, as indicated above," it does offer some truthful statements which suggest an answer, and which, I trust, will incite the professsion to aid me in the further prosecution of this very interesting and important line of investigation.

CONTAGIOUS PLEURO-PNEUMONIA.

HOW THE CONTAGION OF PLEURO-PNEUMONIA IS COMMUNICATED, WHY THE DISEASE HAS NOT BEEN EXTERMINATED, AND THE ONLY METHOD BY WHICH IT CAN BE ERADICATED.

By J. W. Gadsden, M.R.C.V.S.

It seems hardly necessary to say that pleuro-pneumonia, or lung plague in cattle, is incurable and highly contagious; but the result of careful research, and the experience of years, shows that the contagion can only be communicated by contact with the living diseased animal.

The disease is so insidious that it has only been after the most careful and thorough tests that this decision could be arrived at.

Animals have been known to carry the disease in their systems for long periods, ranging from three to fourteen months, without evincing any outward symptoms that could be detected by the veterinarian, and were only discovered after they had infected other animals with which they came in contact, and with them were slaughtered.

Again, the disease may verge into the chronic stage, and the diseased portion of the lung become encysted, or enclosed in a cyst or sac; it is said so long as this remains intact they are harmless, but let it once break down and the diseased portion become liquified and pass into the bronchial tubes, the contagion is thrown off with the breath and impregnates all the animals that are in immediate contact.

That this theory is not generally accepted by those interested in the eradication of the disease in this country, I am well aware, and I have taken great pains to fortify myself with the results of the experience of some of the most practical workers and eminent scientists that have given attention to the symptoms and rages of pleuro-pneumonia.

In Pennsylvania, the State that I have the honor to represent, Dr. Francis Bridge has possibly had as large an experience in this disease as any person in the United States. In frequent conversations, and in several letters hereto appended, he states most unqualifiedly that the disease can only be communicated by contact with the living diseased animal.

In his experience as an inspector for over seven years he has seen numerous instances in which healthy animals have been placed on farms and in buildings from which diseased animals had recently been removed to other quarters, or for slaughter, without any disinfection or purifying process being used, but buildings and litter allowed to remain just as they were when the diseased animals were taken out.

He cites one instance where, by accident, healthy animals during the night broke into an enclosure where the carcass of an animal affected with pleuro-pneumonia that had been killed, was allowed to remain unburied, and came into direct contact with

the diseased lung, which was thoroughly impregnated and weighed thirty pounds.

He mentions again several cases where, as an experiment, the food left by diseased animals was fed to healthy cattle, and in none of the instances above recited was a single animal affected, nor was the contagion conveyed to one of them.

But perhaps the most conclusive test, and the one on the largest scale, was made in the city of Chicago, at the sheds of the Shufeldt Distillery. The sheds had been occupied by cattle affected with pleuro-pneumonia, 445 out of 897 being found diseased; and the last ones were slaughtered on December 10, 1886. Messrs. Shufeldt & Co. were anxious to refill their sheds, and made application to the State Live Stock Commissioner for permission to do so. Having been called upon, I gave my opinion that this would be entirely safe, *provided* the animals brought in were perfectly healthy. Upon Mr. Shufeldt guaranteeing this, the commissioners gave the necessary permit, and on December 18, 1886, 894 fresh, healthy cattle were brought in and kept under strict quarantine until the time of slaughter, which was during June and July, 1887. Each animal was carefully inspected, and a post mortem examination made by Dr. John Casewell, State Veterinarian, a man thoroughly familiar with the disease, its symptoms and characteristics. He reports that these animals were all found free from any taint of pleuro-pneumonia.

Although these sheds stood empty for a time and were partially disinfected, the flooring was not removed and the mangers and fixtures remained, the only essential precaution insisted on being that none but absolutely healthy cattle should be introduced.

The experience in this case is not a singular one, and although I was looked upon as bordering on rashness in giving this opinion, yet from my own experience of many years, and the testimony of those in whom I had the most unbounded confidence, I felt assured that I was right, and the result has proved the correctness of my opinion.

Professor Williams, Principal of the Veterinary College, Edinburgh, writes under date of September 19th: "My experience leads me to conclude that it is safe to place cattle in sheds which

have been previously occupied by those having pleuro-pneumonia, and that the *contagion* is only virulent when conveyed by the living animal."

Clement Stephenson, F.R.C.V.S., Inspector for Northumberland, in a letter of September 10th, says: "Although I never had any doubt as to the so-called experiment at Chicago, it is still gratifying to find that it has worked out as we predicted."

Professor James McCall, Principal of the Veterinary College, Glasgow, Scotland, under date of September 26th, says: "I have much pleasure in acknowledging receipt of yours of 2d inst., intimating the result of your experiment with the cattle in the sheds of the Shufeldt Distillery, and I should have been disappointed had it terminated otherwise. I have for the past twenty years maintained that the contagion of pleuro-pneumonia is only spread by the living affected animals, and that cohabitation is necessary."

Professor Thos. Walley, Principal of the Royal Veterinary College, Edinburg, in his letter of September 26th, is more conservative, and while he does not deny that the disease can only be communicated from the living animal, neither does he affirm it, but says: "One swallow does not make a summer, you know, and perhaps if your experiment is repeated the result may be very different."

Professor J. Wortley Axe, Professor of Pathology in the Royal Veterinary College, London, says in his letter of October 10th: "It has always appeared to me that the virus of the disease is peculiarly unstable, and to be effective requires to pass directly from the respiratory organs of the sick to the healthy, and hence it is that cohabitation, or contact of the former with the latter, is rendered necessary to the propagation of the disease."

So while assertions have been made that the disease has been carried in the clothing of attendants, or remained in sheds and buildings from which diseased animals have been removed, yet in no instance has any authentic proof of this been produced; while on the contrary we have the evidence of college principals and professors and men which have given years of study to the disease, and with the single exception of Professor Walley, who is

non-committal, they all state in the most emphatic terms that by direct contact alone with the living animal can the disease be communicated.

Professor Brown, who, as adviser to the British Government, receives reports from hundreds of inspectors, and is kept fully advised of every outbreak and the circumstances attending it, and has made numerous experiments himself to determine this question, gives his evidence in the same direction in no uncertain terms. Dr. Bridge, who has been a practical worker in the disease in this country for years, is equally decided in the stand which he takes, and last, but not least, is the test at the Shufeldt Distillery, which was the largest ever made, and made, too, in the face of the strongest protests from those who at the time held different opinions, and as to the successful result of which you have the testimony of another practical worker, Dr. Casewell.

In this one respect pleure-pneumonia differs from all other contagious diseases in cattle, for in all the others contagion may be carried by *immediate contact*, through food, clothing, buildings, etc., while this alone requires contact with the living diseased animal.

WHY THE DISEASE HAS NOT BEEN ERADICATED.

Pleure-pneumonia has existed in portions of the United States for over forty years, and spasmodic efforts have been made in various localities to get rid of it, but there has all along been a tendency to make light of it, and those residing in the sections of the country not affected, have disbelieved in its existence.

Whenever an attempt was made to secure adequate legislation to stamp it out, the cry was raised that it was simply in the interest of some department of the Government that desired the employment of a number of men, and the expenditure of a large appropriation.

False statements were made to and repeated by members of Congress, and sectional prejudices were invoked to defeat proper legislative action.

Ignorant persons have attempted the treatment of the disease, and farmers and cattle raisers have concealed its existence; while

those charged with the enforcement of the State laws have been so lenient or negligent that diseased animals, and those exposed to the disease, have been permitted to be removed from point to point, in spite of so-called quarantines that amounted to nothing.

So long as the disease remained in the Eastern States, those in the West ridiculed it, and even after it had reached the Western States, doubts as to its contagious character were insisted upon, until its ravages became so wide-spread that the danger could no longer be denied.

Local jealousies and want of co-operation, inadequate appropriations to pay for animals killed, and a general want of knowledge as to the nature of the disease, have been the causes that have prevented our getting rid of it; and if not speedily corrected, will be the cause of its still further spreading until it reaches the ranges of the far West and Southwest, where all means of eradicating it will be hopeless.

Such being the case, by what method shall we rid the country of the disease?

Firstly. By prohibiting the importation of live animals from all countries where the disease exists.

Secondly. By the prompt slaughter of all animals affected with it, and those that have in any manner come in contact with them.

To secure this we must have the whole power of the National Government exercised, and the earnest co-operation of State and Territorial authorities.

It will involve the slaughter of many animals that may show no outward taint of disease, yet which from their exposure to infection may be the means of transmitting it to others.

When the disease is discovered on any premises, allow no animal to be removed alive; but, after examination and appraisement by the proper authorities, have all slaughtered, the healthy animals for beef, and the diseased ones for burial.

Place a fair valuation upon every herd infected, and after deducting the price received for the carcasses of the healthy ones, pay the owner the balance of the appraisement promptly, in cash.

Impose heavy penalties upon all owners of cattle who fail to

notify the proper authorities of the existence of disease, and where it is verified by an examination of skilled veterinarians, allow no discretionary power to executive officers, but compel prompt slaughter.

If these regulations are adhered to strictly, pleure-pneumonia will soon be exterminated, and if care is exercised, it never need be re-introduced; for it is not indigenous to American soil, but was in the first instance imported from abroad, and has slowly but surely spread from point to point, until it has assumed its present vast proportions.

PROF. B. GRASSI ON THE TŒNIA NANA.

By Cooper Curtice, D.V.S.

During the past year Prof. B. Grassi, of Catania, Italy, has been studying the life-history of *Tænia nana* and the result of his observations have been published in the *Centralblatt für Bacteriologio und Parasiten kunde*: Bond I, No. 4 and 9; Bd. II, No. 4 and 94; No. 10 and 282; No. 11 and 305. His study of this species leads to results so different from the hitherto established theory of the life history of the armed tænia that we are led to believe that there may be for some of the species, if not all, two methods of development.

Prof. Grassi holds that Tænia nana, which is quite frequently found in Egyptians and Italians, is identical with or a variety of Tænia murina, which infects rats (Mus decumanus). The experimental portion of Grassi's studies were performed with Tænia murince: should his identification of the two species as the same, or varieties of the same, obtain, as he seems to firmly establish, then his studies will have a doubly important value.

After vainly searching for the cysticercal stage of Tænia murina through all of the more common species of snails, insects, myriopods, etc., which lived in or around the slaughter houses where all the rats examined were infected, he at length turned his attention to feeding the ripe proglottides to uninfected white rats. He succeeded in infecting them with large numbers of

these tænia while some rats which were selected from the others and which were not fed remained uninfected. The large numbers of tænia found (ordinarily there are but two or three) the young stages found corresponding in size with the time elapsed from the date of feeding, and the accuracy with which Prof. Grassi and his assistant S. Calandouccio have carried out and detailed their experiments, preclude the possibility of error. He thus has proven that the development is direct and does not require an intermediary host, as was formerly supposed.

One or two of Stein's cysticercus which have been described from meal-worms, and which have since been held to be the intermediary stage, were found and fed to a man but with no result. In dissecting a large number of these worms the author was forced to conclude that there was not sufficient cysticerci to account for the abundance of tænia in the rats. In the light of Stein's investigations, however, I think we should hesitate in accepting the direct development of the eggs of T. murina as their only method of development, for it should be borne in mind that the cysticercal stage of tænia appears after all to be but a stage of arrested development. That these tænia could have these two methods of development seems, in the light of the present knowledge, to be the most plausible explanation of the phenomena presented.

Prof. Grassi identifies T. murina with T. nana on account of their strict anatomical resemblance, and makes a varietal difference between them on account of the difference in size, T. murina varying between 10–12–20 mm. and T. nana between 33–35–40 mm. The hooks of each are alike in size, form and numbers, (24–28). He describes an inconstant slight difference in the eggs. The importance of this identification, together with the life-history of T. murina and T. nana, has its bearing on the treatment of human patients infected with this parasite.

Helminthologists will not be slow to substantiate or disprove the accuracy of these observations, and to experiment with other species. Now that another line of experimentation has been entered upon we may expect that our knowledge of this interesting class of parasites will soon increase.

HYPODERMIC MEDICATION AND ITS APPLICABILITY IN EQUINE PRACTICE.

By J. Roberts Nayler, D.V.S., Ph.G., Jersey City, N. J.

Having long felt the necessity in equine therapeutics for a better method of administering medicaments to our patients than the common mode recognized by practitioners of all grades, it occurred to me recently to try the hypodermic method, for two important reasons, viz: 1st. On account of its easy administration; 2d. Because quick results can be obtained, and that with the least minimum of annoyance to the practitioner. Take, for instance, the removal of a serous cyst, which sometimes, with a fractious animal, gives the operator a great deal of trouble, whichever way he chooses to undertake its removal, whether by surgical operation, seton, or the insertion of hydrargyrum bichloridum and acid arsenicum, or even the ligature to which many resort in order to effect its removal.

Instead of any of the foregoing methods, it has been my plan of late to insert, hypodermically, acid. carbolicum; and since resorting to this procedure, I have met with much less annoyance (and in each instance with complete success) than with any of the means above enumerated. I usually inject the acid carbolicum in a solution containing 10 per cent.; in some cases I have even used the pure acid, and in no single instance have I met with any but good results.

In rheumatoid affections of the joints, when it seems extremely painful for the animal to move, brilliant results often ensue from a 2 to 5 per cent. solution of acid carbolicum, hypodermically inserted as near the seat of the pain as it is possible to locate the same. Partial anæsthesia ensues in a few minutes, and our patient seems relieved of the pain.

In simple colic, the hypodermic injection of morphia acetatis has in my hands been the means of giving prompt relief, especially when combined with gelsemin.

I have also found the administration of pilocarpin, hypodermically, in pneumonia (when no indication of any weakness of

the heart's action can be ascertained), to give better results than from medicaments inserted into the stomach.

Even in tetanus the hypodermic injection of remedies such as acid carbolicum, pilocarpin, nicotine, morphine and strychnia, promises better results, with the least minimum of trouble, than all the heroic doses of potassium bromidium, chloral hydrate, or any of the nerve sedatives can be expected to accomplish when given by the mouth, even when it is possible to do so.

The list of active principles suitable for hypodermic medication are very numerous, and at some future time I may compile a list of the same, with their doses, mode of preparing solutions, etc. But before resorting to this method, I would like to offer a suggestion to the veterinarian: In the first place, see that you obtain a properly graduated *syringe* (and that it is absolutely correct in its capacity). I have found many syringes to vary from 5 to 15 per cent.; the one I use has a capacity of 120 minims, equal to two fluid drachms. In the next place, be sure you obtain the purest alkaloids, and, if possible, use only freshly prepared solutions; also, in making the solutions, use no more acid to dissolve the alkaloid than is necessary; it is the better plan to obtain a soluble salt, such as the sulphate of styrichnine, instead of the alkaloid styrichnia, with which to make the solution, and after each insertion be careful to cleanse your syringe and needles, and make them antiseptic by immersion in a solution of carbolic acid, as cleanliness in this particular is absolutely necessary to secure complete success. Judicious care also should be exercised in choosing the proper location for inserting the needle, so that no important artery or vein is wounded. Of course it is understood that the cellular tissue should invariably be the part of the anatomy in which to place the medicine. I would also like to impress upon the operator the necessity of seeing that no air is drawn into the syringe between the plunger of the syringe and the medicine which it is intended to administer; because if these little minutiæ be overlooked, abscesses are very liable to form at the point of juncture, and cause much trouble to the careless veterinarian; but should ordinary precautions only be taken, I feel convinced that this method of medication will

give quite as much satisfaction to the veterinary surgeon as it has given to the physician in his practice. It also lifts the educated veterinarian to a higher plane in the eyes of his patrons, and gives to veterinary science the place it so much needs.

EXTRACTS FROM FOREIGN JOURNALS.

DIARRHŒA IN SUCKING CALVES AND COLTS.

By O. Schwarzmaier, Director of Breeding Station.

(From Centralblatt fur Veterinar Wissenschaften, No. 49, 1886.)

In his hand-book on "Veterinary Obstetrics," Franck describes this malady as one of the most important and fatal in newly-born animals, and surely everybody will agree with him.

Expedients of every kind and description are recommended and applied by practitioners to overcome the fatal results, but nowhere do we find a reliable mode of treatment recorded. It is clear that the chief aim of both breeder and veterinarian must be directed particularly toward extirpating the agitators of the disease before the birth of the calves or colts, which, according to the predominant views of both the older and newer schools, are to be sought for in a stable miasma as yet undetermined.

To this end, after thoroughly cleansing the stalls of the mother animals, an application of a sublimate solution, about 1-1000, is most trustworthy. For instance, here in the stud I have the box stall of the mare (which is plastered and provided with drainage) disinfected with the above mentioned remedy about two or three days before the act of birth, and thus far with the result that diarrhœa appears less frequently, and, with the exception of a single case (mentioned below), in a much milder degree than formerly. Two or three days after foaling, the stalls are again disinfected in the same manner, and the bedding which is soiled by the liquor amnii, blood, etc., is carefully removed.

It is not to be expected that in stables injudiciously constructed, where there is nothing but bowlders, wooden floors, or where the animal is even obliged to lie on the bare ground, disinfection

can have the desired effect; in fact, farmers in general will not take these measures, but where it can be done it should never be omitted.

Notwithstanding the disadvantages existing in our practice, the main problem, as far as circumstances are favorable, consists in removing the existing diarrhœa. If the desired effect be not attained, the fault is not so much in the remedy used as in the doses given. Thus we will find that in the human being, next to tannin, opium as opium purum, or tinct. opii. simpl., which is given almost exclusively with the best results, is also used in veterinary medicine. But how? In doses which, in my opinion, are much too small.

For instance, if pulv. rad. rhei 4, 0, magnes. carbonic, 1, 0, opii pur. 0, 3, with 100 gm. chamomile tea or 50 gm. brandy, is given at once, and then not again until after a lapse of twelve hours, or if 250 gm. althea decoct., tinct. opii simpl. 7, 5, is prescribed, of which mixture 2-4 tablespoonfuls every two hours is given, no trustworthy effect can be expected. We need not be so timid about giving the promptly acting opium; our sucking calves and colts can bear heavier doses. For a long time I have given not less than 4 gm. tinct. opii simpl. at a dose, with a little spts. rectificaliss., or brandy, which was repeated every three to four hours until the diarrhœa was allayed.

When visiting such cases professionally, it can seldom be ascertained whether the prescribed medicine has been given properly, or how often it had to be given before a result was noticed. The owner of the animal merely replies: "The medicine acted like a charm." Here, in the stud, however, I can minutely observe how matters stand in the individual case, and have found that we can give a young colt, be it a day old or older, a great deal of opium, without fear.

Regardless of my former experiences, that opium given in larger doses is a very reliable remedy against diarrhœa in the newly born, I take the liberty of citing the following cases as proof of my assertions:

(1.) A five-day-old, quite strong colt, was suddenly attacked with diarrhœa. Tinct. opii simpl., 5 gm., with a little spts. rec-

tificaliss., was given immediately and repeated every three hours, until, after eighteen hours, the colt received (after deducting something which may have been lost in administering) ca. 25 gm. tinct. opium, with perhaps 50 gm. spirits, and the diarrhœa subsided.

(2.) A four-day-old healthy, though weak colt, was also attacked with diarrhœa, which called forth colic pains. A dose of 5 gm. tinct. opii simpl., with spirits, was given every three hours. The diarrhœa, however, would not abate; on the contrary, after two days of diarrhœa, the appetite was lost; the colt would not suck any more; an involuntary watery, grayish, offensive alimentary discharge escaped continually, and upon no change taking place on the third day after giving rheum with opium purum aa. 5 gm., with decoct. althea, and hope of saving the colt was nearly abandoned, opium purum, 30 gm., with althea powder, was made into six small pills, one to be given every three hours, and not until the last dose of opium was taken, at the end of the fourth day, did improvement set in, and the colt to the present day is very lively.

(3.) Another colt, four weeks old, did not suffer with diarrhœa, but with colic, to such a degree that displacement of the intestines was suspected. The colt received, within three hours, tinct. opii simpl. 10, 0, and morph-hydrochloric 0, 3, internally. The pains subsided, and the colt recovered.

I have noticed one thing, that after giving such large doses of opium the colts will continually, for a longer or shorter period, walk slowly around in a circle in the box stall. Whether this is due to the opium, or to the dull pains in the intestines—as in dogs suffering with tape-worm, who move rapidly in a circle—I am not prepared to determine; but no trace of actual poisoning could be detected. According to my experience, such diarrhœas usually abate after 12 to 15 gm. tinct. opium at most, thus after three doses of 4 to 5 gm. each. Should there still be no change, six or ten hours must be intermitted, and then the doses repeated.

It is necessary at the outset of the disease to give the animals plenty of dry bedding, and to cover them well with straw or

blankets. But the main thing remains, that help be brought just so soon as it is noticed that the diarrhœa hcs set in.—*Adam's Wochenschr.*

REPORTS OF CASES.

RUPTURE OF THE LIVER.

By W. H. Pendry, D.V.S.

I was lately called to see a fine bay carriage horse, seven years old, said to be lame; to use the owner's words, "Not exactly lame, but shows a peculiar arching of the back, drawing himself all together, as it were, when starting off, particularly after having stood some little time." I made a careful examination, could find no cause for such a state of things as described by the owner; in fact, could not make the horse lame, with the exception of a very slight stringhalt in her hind leg. The owner requested me to use the horse for a day in the hope that he would exhibit some of the symptoms described by him. I did so, but he failed to show anything. I wrote the owner the result, but stating that, from the history, I was of the opinion that there was some organic trouble, but just what I was unable to say, and he having asked me to advise him whether to keep or sell the horse, I advised him to sell at once. About a week after I was again called to the same stable to treat a case of colic. On arriving there I found this same horse to be the cause of my hurried call. I found him laying in his stall partly on his back, almost quiet, with his feet up against the side of the stall. After considerable trouble he was got upon his feet, and on examination I found the pulse hardly perceptible, countenance anxious, perspiration pretty general, but more particularly about the abdominal walls, a peculiar trembling of the muscles of the off shoulder (supporting the theory that "in liver complaint the horse is often lame in the right foreleg, as if the pain extended to the shoulder"), temperature, 103 F. I however diagnosed the case as one of colic, with some complication, and gave a very doubtful prognosis. I administered sedatives, and had the horse turned into a loose

box; he at once lay down, using great care in doing so, then looked anxiously at his side as in colic and rolled over on his back, which position seemed to give him ease. I revisited the case in about four hours and gave opiates, but death ended his sufferings in about nine hours after I was first called; going off as if he had fallen asleep looking at his side. I ordered the removal to the offal dock as soon as possible, so as to have a post-mortem soon, as gas began to accumulate very rapidly.

As a prelude to the post-mortem, I would say that as soon as the skinner began to remove the skin he remarked, "Doctor, you have a rupture here," and further, on removing the abdominal walls, inserted his hand and pulled it out full of a dark substance (not simply coagulated blood). The intestines were carefully removed, but no rupture found; there were some anti-mortem congestion, but most of the congestive lesions I concluded post-mortem. On making a longitudinal section of the intestines, they were found to contain very dry fæcis, the inner surface of the intestines were highly fluted with gas between the outer and inner surface, which could easily be reduced by pressure. The spleen and kidneys seemed to be all right, but on examination of the liver, it was found to be ruptured, and the whole of its substance found to be of the consistency of very soft mud, being rather grayish in color; it could be easily taken up in the hand and squeezed through the fingers, resembling what was first discovered by the skinner on opening the abdominal walls. I made known the result of the post-mortem, and gave it as my opinion that the horse had suffered with a disorganized liver, and that his periodical lameness was due to that fact.

FISTULA OF STENON'S DUCT.

By J. S. Butler, V.S.

On the 18th of November last, as I was passing the farm of Jacob Yenney, Esq., near this city, my advice was asked concerning a two-year-old colt, which he said had distemper and a running sore on the jaw. I went in and found the colt to be suffering from strangles and a fistula of Stenon's duct.

Upon inquiry I found the fistula was due to an empiric lancing an abcess at the angle of the jaw where the duct winds around it and opening the duct. The colt had been in this condition for several days, and in feeding dry food enormous quantities of saliva were discharged. This, together with strangles, was debilitating the animal greatly.

I prescribed flexible collodion to be frequently applied, and ordered a sloppy diet. Two or three days afterward the owner brought the colt to my infirmary when, upon examination, I found the fistula had closed, but the face was badly swollen from the old opening to within about three inches of the opening into the mouth, thus showing there was either an obstruction or obliteration of the duct anterior to the swelling. I made an opening into the duct at the termination of the swelling and tried to pass a probe into the mouth, but failed on account of the duct being obliterated. I decided to try and form an artificial duct, so I threw the animal and, with the help of an assistant, succeeded in passing a blunt pointed needle with a good-sized waxed thread through into the mouth, having previously put in my mouth speculum and guiding the needle into the mouth with my left hand. I fastened the thread securely to a flat button and pulled it close against the cheek on the inside, then fastened it externally to a small stick placed against the face. Gave nothing but gruel to eat. Left the seton in five days, until it began to suppurate, then removed it and closed up the opening with flexible collodion, which I had no trouble in doing. Then gave some dry food, when, to my delight, I found I had succeeded in establishing an artificial duct.

SOCIETY MEETINGS.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

At a regular monthly meeting of the Keystone Veterinary Medical Association, held at the Veterinary Department of the University of Pennsylvania, January 7th, 1888, the meeting was called to order by its President, Dr. Zuill.

At roll-call eight members answered to their names. The minutes of the two preceding meetings were read and adopted, with a slight alteration in those of the last meeting.

Dr. Hoskins reported, on behalf of the Committee on Credentials, that he recommended S. J. J. Hargn, V.M.D., as a reputable graduate of the University, and Dr. Otto Von Lang, as a graduate of the Columbia College, of New York, but the latter having withdrawn his application, it was unnecessary to proceed with the election.

Dr. Zuill reported on behalf of Committee on Revision of Constitution that, owing to an oversight, they were not prepared to report.

Dr. Francis Bridge and Dr. C. K. Dyer were each appointed to read a paper, but were both absent.

Dr. Charles M. Cullen was then called on but was unprepared, and was then requested to pay his fine to the Treasurer.

Dr. Charles T. Goentner reported a very interesting case of calculi in the urethra of a grey gelding which he had under his care with injuries received from barbed wire fencing. The animal had shown colicky pains for nearly forty-eight hours before he had been called, and on examination the Doctor found an enlargement in the scrotal region, which he was able to work down to within about seven inches from the end of the penis, was enabled to reduce it enough to remove by breaking off small portions by means of a pair of long dressing forceps, but the operation was tedious and attended with copious hemorrhage. And on subsequent removals of urine by means of catheter, the animal fainted but was revived by means of stimulants and finally made a good recovery.

Dr. Formad then mentioned a similar case in a dog; the operation of lithotomy being performed, but animal only survived a short time, dying of uræmia. The post-mortem show abscesses in kidneys, purulent cystitis and urethritis.

Dr. Zuill objected to the treatment employed by Dr. Goentner, and thought urethrotomy would have been preferable and less likely to cause stricture. He then produced specimens of calculi in dogs, and mentioned one in a dog as young as eighteen months.

Dr. Goentner thought his results proved that his treatment was correct, and that if urethrotomy had been performed he might have had a fistula. Dr. Glass thought that, owing to the universal uncleanly condition of the parts, a wound would be attended with bad results, and that retaining a catheter in the bladder was dangerous by causing relaxation of the sphincter.

Dr. Hoskins coincided with Dr. Goentner, and said that stricture seldom or never followed the natural passage of stone in the human family, and spoke of the danger of opening all such canals and their slow and tedious healing.

Dr. Goentner thought there was often great danger of too hasty operation, and that if the knife were only used as a last resource we would have less need of it.

Dr. Hoskins mentioned a case of retention of urine in a bitch, fourteen inches in height, that did not urinate for ten days and whose belly touched the ground, and on removal the urine measured three pints.

Dr. Zuill then produced a very interesting specimen of papilloma in the oral cavity of a dog, the whole surface being completely studded.

Dr. Formad said it was unknown in man, although it *did* occur on the *vocal* cords. He also volunteered to make a *systematic* classification of tumors as found in veterinary practice, if our veterinarians would kindly assist him with the specimens occurring in their practice.

Dr. Goentner asked if there was any constitutional treatment for warts.

Dr. Formad said laxatives were considered good, but that as a local treatment chromic acid was the best and not at all painful.

Dr. Zuill mentioned the negro superstition of rubbing the affected part with a dead fowl and then *secretly* burying the carcass.

Dr. Goentner mentioned the use of carbolic acid as positive.

Dr. Hickman reported a case of peculiar mange in a herd of cattle, occurring in his practice. Adjourned.

CHAS. WILLIAMS, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

The fifth annual meeting of the Ohio State Veterinary Medical Association met in the City Hall, Akron, Ohio, January 10, 1888. The President, Dr. J. C. Myers, Jr., of Cincinnati, called the meeting to order by a few very appropriate remarks, and then proceeded with the regular business of the meeting.

At roll-call twenty-three (23) members responded. Minutes of previous meeting read and approved. Election of officers resulted as follows, viz. :

President, Dr. J. S. Butler, Piqua; 1st Vice-President, Dr. N. R. Howe, Dayton; 2d Vice-President, Dr. Gribble, Washington C. H.; 3d Vice-President, Dr. Miller, Washington C. H.; Recording Secretary, Dr. N. Shaw, Dayton; Corresponding Secretary, Dr. D. P. Yonkerman, Cleveland; Board of Censors, Drs. Derr, J. D. Fair, J. C. Myer, Jr., N. R. Howe.

The meeting then adjourned to meet at 1.30.

At the appointed time the new President, Dr. Butler, opened the meeting with a few well-chosen remarks, and thanked the members for electing him to such a high and honorable position.

Dr. J. C. Myer, Jr., gave notice of motion to change the Constitution and By-Laws. A committee, consisting of Drs. Newton, Whitehead, Howe, Myer, Jr., and J. D. Fair, were appointed to draft such new clauses and changes as they think best and report the same at next meeting for consideration of the members.

New members proposed, balloted for and accepted: O. J. Carter, V.S., T. N. McDermott, V.S., C. Crisman, V.S.

A resignation from T. S. Butler, V.S., was accepted, owing to his being permanently located in another State. Several members expressed their regret for losing such an able and active member. It was moved, seconded and carried unanimously, that the best wishes of this Association be tendered Dr. Butler for future health and prosperity.

Dr. J. D. Fair, of Berlin, read a very able paper on glanders and farcy, which led to an able and lengthy discussion. Three or four members claimed the *virus to be volatile.*

Dr. Torrance, of Cleveland, read an able paper on the use of electricity in veterinary practice.

Moved by Dr. Newton and seconded by Dr. Shaw, that the above papers be sent to the AMERICAN VETERINARY REVIEW for publication.

Dr. Whitehead read a paper on tetanus, and a lengthy discussion followed, in which all members took part. Several new remedies were brought forward, some members having had a great number of cases, which they treated with good success. * * * *

Dr. Miller very elegantly described an operation which he lately performed, which consisted in the removal of a large pharyngeal polypi.

Dr. Grebble read an able paper on Actinomikosis, which was ably discussed.

Dr. Burnett read a very interesting paper on volvulus.

On motion, Dr. J. D. Fair, of Berlin, was appointed to attend the United States Veterinary Medical Association as a visitor, for the purpose of inviting that Association to meet the Ohio State Association at our annual meeting.

The meeting then adjourned to meet in Cincinnati in July; day to be named by the President and Dr. Myer.

N. Shaw, *Secretary.*

KANSAS VETERINARY MEDICAL ASSOCIATION.

The Kansas State Veterinary Medical Association held its annual session in Topeka, Kan., Dec. 15, 1887. The officers elected for the coming year were:

President, Dr. Holcombe; Vice-President, Dr. Epperson; Secretary, Dr. Allen; Treasurer, Dr. Moore; Board of Censors, Drs. Phillips, Epperson, Gragg, Moore and Allen.

Although not one-half of the members were present, the occasion was a very enjoyable one, due partly, no doubt, to the fact that the Short-Horn Breeders of Kansas were holding a meeting at the same time, and by a little changing of hours the members of each Association were enabled to attend the other. We most certainly felt highly honored by having so many prominent breeders and farmers meet with us and discuss subjects in which they are deeply interested.

A paper on "The Physiological Laws of Inheritance" was read by Dr. Epperson, and the discussion of the same readily centred upon tuberculosis, which was discussed at some length by the members and others. Prof. Shelton, of the State Agricultural College, said he believed this disease of all others the most dangerous one with which the American farmer has to contend to-day, and, considering its nature and wide dissemination, it will be the most difficult to extirpate; that when the great loss of human life directly traceable to this cause is taken into consideration, it becomes a matter of the gravest importance. Attention was called to the fact that unscientific persons know but little of this disease, hence the urgent necessity for more general information regarding it.

Dr. Bateman read a paper on the subject of "Castration," in which the various methods were considered. In his own practice the essayist preferred the use of clamps, in ridgling castration, to that of the ecraseur. The opposite view was entertained by Drs. Moore, Epperson, Allen and others.

The farmers and stock-raisers present improved the opportunity to bring up and discuss a variety of subjects, and to ask questions regarding cases in which they were individually interested. After some other routine business of minor importance, the society adjourned to meet in Topeka in March.

Ed. R. Allen, *Secretary.*

LIST OF GRADUATES

AT DECEMBER EXAMINATION OF ONTARIO VETERINARY COLLEGE, TORONTO, ONT.

Names	*Residences.*
Baxter, G.	Michigan, U. S.
Broad, W. F.	Sonya.
Clapp, W. H.	Dresden.
Cooper, H.	Davisville.
Collins, C. O.	Obolds, Pa., U. S.
Coates, R. C.	Bothwell.
Carpenter, W. H.	Holly, N. Y., U. S.
Cunningham, E. E.	La Porte, Ind., U. S.
Dean, H.	Tavistock.
Ewing, W. A.	Newmarket.
Evans, W. M.	Simcoe.
Huck, W. H.	Milmay.
Kannon, M.	Montreal, Quebec.
Kumpt, W. A.	Waterloo.
Kintner, S. P.	Wooster, Ohio, U. S.
McMurray, O. M.	North Baltimore, Ohio, U. S.
McLaren, C. L.	Highgate.
Oyler, J. N.	Harrisburg, Pa., U. S.
Pike, F.	Toronto.
Shillinglaw, W.	Staffa.
Story, R. W.	Princeton, Ill., U. S.
Taylor, B.	Hillsborough, Dak., U. S.
Thomson, W.	Orillia.
Walker, R. J.	Clogher, Ireland.

REVIEWS AND NOTICES.

NOUVEAU DICTIONAIRE PRATIQUE DE MEDECINE DE CHIRURGIE ET D'HYGIENE VETERINAIRES. Begun by H. Bouley and continued by A. Sanson, L. Trasbot and E. Nocard.—Vol. 14 (Asselin, Place l'Ecole de Medecine, Paris.)

The completion of this excellent work, which since the death of H. Bouldy, has been continued under the able direction of the new authors, his former collaborateurs, is now, we trust, an assured fact, and that in the near future. The volume just published, forms, like its predecessors, a book of over five hundred pages, and contains numerous articles, by writers well known, not

only to French but also to foreign authors. Besides the names of the three principle authors of the dictionary, we find those of Mr. Kauffman, on narcotics and narcotism; of Mr. Cadiot, on navicular disease and on the pathology of the œsophagus; of Mr. Lulainche on neoplasms, on the pathology of nerves, on neuromas; on obliteration and occlusion; œdema, diseases of the conjunctiva; of the lacrymal apparatus; and on cataract; of Mr. Barrier, on the general anatomy and physiology of nerves and on that of the eye; of Mr. Comeny, on plantar neurotomy; of St. Cyr, on obstetrics, and of Mr. Ruilliet, on the various œstri. The book is completed by Prof. Sanson, with several articles on zoötechny; by Prof. Trasbot, on necrobiosis, neurosis and various affections of the eye; by Prof. Nocard, on a peculiar skin disease of sheep, and on the pathology of the nasal cavities. The fourteenth volume of the Dictionaire will, we are confident, be specially welcomed by French readers, for such of its contents as serve to supply certain deficiencies hitherto existing in veterinary literature.

LE PIED DU CHEVAL ET SA FERRUVE. By A. Watrin.

A resumé of observations, experiments and discoveries made by the author during a practice of several years, and which he now offers to the public for their consideration and judgment.

OESTERREICHISCHE MONATSSCHRIFT FUR THIERHEILKUNDE UND REVUE FUR THIERHEILKUNDE UND THIERZUCHT. By Alois Kock. Vol. 13; No. 1.

For the past twelve years our worthy friend, the editor of the *Revue*, published his work in separate sheets. In the thirteenth volume the style is changed, and it now comes to us in the more convenient pamphlet form, comprising forty-eight pages of interesting original articles, and reviews of continental journals. We congratulate Doctor Alois Kock on his new departure, and hope that the success of the future will quite equal that of the past.

BOOKS AND PAMPHLETS RECEIVED.

*LES INVISIBLES. By Fabre Domergue.

†LA QUESTION D'IDENDITE DE NATURE DE LA MORVE ET DU FARCIN CHEZ LE CHEVAL ET CHEZ L'HOMME. By G. Chenier.

*The invisibles.

†The question of the identity of glanders and farcy in the horse and in man.

THE QUARTERLY JOURNAL OF VETERINARY SCIENCE IN INDIA. No. 21; Vol. 6. By J. H. Steel and F. Smith.

Comprising much useful matter and making a valuable addition to any library.

REPORT OF TERRITORIAL VETERINARIAN OF WYOMING.

IL VIRUS DELL 'AVENITE EQUINA. By Dr. Leopoldo Baruchello.

L'INDIRIZZO E IL METODO, NELL 'INSEGNAMENTO DELLA ANUTOMIA VETERINARIA. By Dr. A. Lanzillotti Buonsanti.

OBITUARY.

PROF. W. ROBERTSON, of London.

The death of Prof. W. Robertson, Principal of the Royal Veterinary College, took place on the 15th of December last, in the fifty-seventh year of his age. Prof. Robertson received his professional education at the Edinburgh Veterinary College, where he graduated in May, 1860. He filled several high positions connected with veterinary education, and in 1881 was appointed Principal at the Royal Veterinary College, in place of Prof. Simonds, retired. Prof. Robertson wrote a number of articles in the *Veterinarian* and in the *Journal of the Royal Agricultural Society*. His last work, on Equine Medicine, published in 1883, is a valuable memento added to veterinary literature. At the time of his death, which took place suddenly from heart disease, he was engaged in writing and rewording some reports; correcting proofs for a new work which was soon to be published.

CORRESPONDENCE.

ANSWER TO ETHICS.

Toronto, Jan. 9, 1888.

Editor American Veterinary Review:

Sir.—In reply to Ethics' inquiry in the December number of the Review, I respectfully beg to state that the Examining Board of the Ontario Veterinary College *does not* grant any Fellowship degree.

The Veterinary Medical Society in connection with the College grants *a certificate* of Honorory Fellowship to each student who has conformed to the rules of the society on completing his collegiate studies and obtaining the Diploma of the Council.

I am Sir, Yours truly,

ANDREW SMITH.

HONORARY TITLES OF ONTARIO VETERINARY COLLEGE.

Editor American Veterinary Review :

DEAR SIR.—Will you allow me to make a few remarks on the subject brought forward in your last issue with regard to the honorary degree said to be conferred by the Ontario Veterinary College. Many of your readers who are graduates of that institution will doubtless know how that title originated, and will be as ready as the authorities of the College themselves doubtless are, to condemn the action of some of their fellow-graduates which gave rise to such a rumor.

I do not, of course, speak with authority, but with a positive knowledge of the facts when I say, that any such title is entirely self-assumed, and assumed in ignorance of its true meaning, if, indeed it has any meaning. The Ontario Veterinary College, like most other educational institutions, holds competitive examinations at the conclusion of each term in the various subjects embraced in its curriculum, and the successful competitors, those who obtain a high percentage of marks in their examination papers,—are held to have obtained honors in their classes and are to have their names inserted in the next catalogue of the college as having obtained such honors.

These being merely class-examinations conducted by the educators themselves, and not by the Examining Board, have of course, nothing to do with the examinations for graduation, but I am positive that it is on the strength of this questionable honor alone that some ambitious individuals have presumed to dub themselves "Honorary Graduates" of the Ontario Veterinary College. It is a mistake born of ignorance on the part of the "Honorary Graduates" themselves, and as such does not reflect

at all upon the honorable institution from which they graduated, as some of the graduates of rival colleges doubtless are only too ready to assume.

Unprofessional conduct among veterinary (and medical) practitioners of a character even more heinous than this is not by any means uncommon in this country, nor is it characteristic of the alumni of any particular college, and while the few "Honorary Graduates" of the Ontario Veterinary College may choose to subject themselves to ridicule, the numerous *ordinary* graduates of that college will continue by their conduct to guard its reputation as an institution, which, despite its railers, has probably done more for the advancement of veterinary science in America than any other institution in the land. Respectfully,

R. Robson Dinwiddie.

Evanstown Ills., Jan. 12, 1888.

DR. A. PETERS ON PLEURO-PNEUMONIA.

Toronto, January 13, 1888.

Editor American Veterinary Review:

Sir.—In looking through your issue for this month, I was struck with the report of a paper read by Dr. A. Peters, of Boston, before the Massachusetts Veterinary Association. The article in question is entitled, "Infectious Bovine Pneumonia." What I wish to call attention to, with your permission, is the strange, and as it appears to me, erroneous and misleading use of the terms "infectious" and "contagious," by the writer of the paper. The following are his own words as reported: "I do not know that it is a matter of record that there is an *infectious* pneumonia affecting the bovine race," etc. "Of course they were very much relieved to find that the disease was not contagious pleuro-pneumonia." "From the above we can safely conclude that this is a specific infectious lung disease, due to the presence of a small micrococcus."

As I understand it, there is not recognized nowadays any infection other than by a specific virus or contagium, which is

communicated from animal to animal, either directly by immediate contact with a diseased animal, or indirectly through contact with an infected or contagium-bearing medium. Formerly it was held, of course, that the second or indirect mode of infection was brought about by means quite different from those operating in the case of contagious disease; that the propagation of *infectious* diseases depended on a something, an influence quite different from the contagium of such disease; for example, as syphilis or small-pox. But since the discovery and attempted classification of specific disease germs, surely all that has passed away. That Dr. Peters himself does not believe in infectious diseases not propagated through a contagium, his experiments with the guinea pigs and his conclusions drawn therefrom plainly show. Is it not a pity then, that he should make such a use of terms as will be apt to produce an erroneous conception in the minds of some of his readers?

Yours truly,

JOHN CAVEN,
Ontario Veterinary College, Toronto.

ASSISTANT WANTED.

Editor American Veterinary Review:

Please insert the following in your excellent journal:

WANTED.—A graduate of a veterinary college (one that can speak German preferred). Will give him an interest in a good practice. Correspondence is solicited. Address, Post Office Box 721, Geneseo, Henry County, Illinois.

FROM DICKEY BIRD.

Editor American Veterinary Review:

In the last volume of the REVIEW was published a very interesting report of the National Veterinary Association of Great Britain, but so far the present volume does not contain any mention of their meeting of last year. The discussions certainly were

of interest enough to the profession of this country to warrant the report again being given.

How is it that we cannot have as full and interesting reports of the United States Veterinary Medical Association? Brevity may be the soul of wit, but in some cases it is a bad rule to apply.

DICKEY BIRD.

[We well approve of the request of our correspondent, but he must not ignore that our pages are often too crowded, and that if we were to make room for all material of interest, beside what we publish, the REVIEW would have to be considerably increased in size, and beyond our facilities.—ED.]

BORROWED FEATHERS AGAIN.

Editor American Veterinary Review:

DEAR SIR.—I would please call your attention to the inclosed card, which I believe is an impostor of the "Hiram A. Kennedy," type, having failed to find the name among the published list of graduates of the American Veterinary College.

Yours,

C. S. ELLIOT, D.V.S.

F. W. BARTHOLOMEW, V. S.,

(Graduate of American Veterinary College, New York City.)

TREATS

ALL DISEASES OF DOMESTIC ANIMALS.

HANDLER AND TRAINER OF TRACK HORSES.

Office: Chas. Prior's Livery Barn.

UNION CITY, - - - - INDIANA.

Of course he is.—ED.]

TO TELL THE AGE OF A HORSE.

By C. E. Martine.

To tell the age of any horse,
Inspect the lower jaw, of course;
The six front teeth the age will tell,
And every doubt and fear dispel.

Two middle "nippers" you behold
Before the colt is two weeks old.
Before eight weeks two more will come;
Eight months the "corners" cut the gum.

The outside grooves will disappear
From middle two in just one year.
In two years, from the second pair;
In three, the corners, too, are bare.

At two the middle "nippers" drop;
At three the second pair can't stop.
When four years old the third pair goes;
At five a full new set he shows.

The deep black spots will pass from view
At six years from the middle two;
The second pair at seven years;
At eight the spot each "corner" clears.

From middle "nippers" upper jaw
At nine the black spots will withdraw;
The second pair at ten are white;
Eleven finds the "corners" light.

As time goes on, the horsemen know,
The oval teeth three-sided grow;
They longer get, project before
Till twenty, when we know no more.

American Veterinary Review,

MARCH, 1888.

EDITORIAL.

American Veterinary Review Prize.—Conditions—The committee. The Recent Outbreak of Glanders in Massachusetts.—Our notice in November, 1887—the report of the Cattle Commissioners—light esteem in which professional opinion is held—majority, though wrong, carries the day—Dr. Winchester is right, any how—experts appointed—their report ignored—Why?—the opinions of the veterinarians of the road—entire ignorance of symptoms recognized by all qualified practitioners as pathognomonic—inoculation confirms the diagnosis of the minority and of the experts—the conclusion is not surprising to us—the result. "Yes, Smother Them."—The sound resolutions passed by the National Farmers' Congress—the bill presented in the Senate and House of Representatives—a horse tamer, said to be "an uneducated man, a cheeky pretender, and a non-graduate," sought to be appointed to establish veterinary schools in the country—the veterinary profession and education as they are and ought to be. Contagious Pleuro-Pneumonia in Pennsylvania.—Did not know it was there, but veterinarians did—resolutions of the Keystone Association—the investigating officials. Army Veterinary Legislation.—A new bill to be introduced in Congress—a good bill, though perhaps lengthy—its indorsement by numerous army officers. United States Veterinary Medical Association.—Next semi-annual meeting in Baltimore.

American Veterinary Review Prize.—An annual prize of *one hundred dollars* is offered by the editorial staff for the best original paper on any veterinary subject. All competitors must send their manuscript before April 1st, 1888, to 141 West Fifty-fourth street, New York City, each paper being distinguished by a special motto and accompanied by a sealed envelope, indorsed externally with the distinguishing motto for identification, and inclosing the name and address of the author.

The prize will be awarded upon the verdict of a committee of five veterinarians, selected from the ranks of the profession at large throughout the United States. The committee consists of Prof. R. Huidekoper, chairman, Dr. J. C. Myers, Sr., A. A. Holcombe, L. Howard, and D. J. Dixon.

The Recent Outbreak of Glanders in Massachusetts.—In the month of November, 1887, we mentioned the fact of a serious outbreak of glanders in Massachusetts, in the suburbs of Boston. The history of this momentous event is ably reported in the annual report of the Cattle Commissioners for 1887, just received; and the results of the incident demonstrate once more the comparatively light esteem in which a professional opinion is held when it is in the minority against that of officials who, though unqualifiedly gentlemen, perfectly honest and of a high intelligence, yet are not possessed of special and technical training.

This is well illustrated in the case before us. Two of the Cattle Commissioners, neither veterinarians, we believe, or, if so, more amateur than regular practitioners, constituted the majority of the Cattle Commission against Dr. F. Winchester, and the result was that a number of horses which had been condemned as diseased and as suspicious by two veterinarians called as experts were released from quarantine and allowed to resume their work. The propriety of ignoring the reports of the experts, after they had been appointed by the Cattle Commission, is certainly questionable, as, while there is a difference in the number of animals condemned, their reports agree on twenty animals examined, which are then condemned, and, in the presence of the facts, it seems, ought to have been destroyed. Well, the majority ruled; these were permitted to go with the others. A question may naturally present itself as to what influence may have been brought to bear on the minds of those two gentlemen who thus formed the majority. We believe that the opinions expressed by some of the veterinarians who inspected the horses for the railroad company must have had weight in the decision of the majority. To say that "they never heard of or saw pin-hole ulceration in connection with glanders;" to deny the existence of the disease because "three lesions—gland, ulcer, and discharge"—were

necessary to satisfy one that a horse is diseased with glanders; or "that the chancre cannot exist without swollen glands," are incomprehensible and unexplainable opinions, to put it mildly. Statements of that nature, when made by those who by their official position are supposed to be *au courant* of modern and recent literature, and of the present advanced pathology, must undoubtedly have had influence of great weight before persons more or less interested in the settlement of a question of the kind. But if those assertions are true, and if the opinions of the experts have resulted in unnecessary expense to the State of Massachusetts, what will be said of the results which were obtained by Dr. Winchester, who, we are informed, called inoculation to his aid to prove the correctness of his diagnosis, with the result of triumphantly confirming it?

We consider the whole transaction as one to be much regretted, as one, we seriously fear, the majority of the Commission may one day be sadly sorry for, and which, we are afraid, will serve as a severe lesson to those who are not well acquainted with the many forms that lesions of glanders are liable to assume. But with all that, the result is nothing more nor less than the one we have too often been accustomed to observe in similar circumstances on this side of the Atlantic. The worst result, however, is the spreading of the disease beyond known limits, and without present power to control, not only in that State, but all over the country. Can we, then, be surprised to hear that glanders exists to a large extent in every State and Territory of the Union, and kills so many animals? Can we be surprised at reading now and then of the death of a human being? Our sanitary veterinary service needs improvement, no doubt.

"Yes, Smother Them."—"*Whereas*, The animal industry of the United States has developed into such magnitude, and is so intimately connected with the present and future prosperity of our country, the intimate and inseparable connection of the plant kingdom thereto demands from our General Government the care of a fostering hand; therefore, be it

"Resolved, *That this Congress, through our Representatives and Senators, ask an appropriation sufficient to found and con-*

duct a scientific school for the teaching of veterinary and sanitary science."

This is a resolution which was passed at the National Farmers' Congress, held, we believe, in the month of November, 1887, in Chicago.

In *Turf, Field and Farm* of Feb. 3d, under the heading of "Smother Them," appears a notice to which no one can be indifferent. It is that the Honorables Mr. Hampton, of South Carolina, and Mr. Wise, of Virginia, one in the Senate, the other in the House of Representatives, have both introduced in their respective houses bills to the effect that "schools for instruction in veterinary science" be established at points most suitable.

Is this last move the result of the wise resolution of the National Farmers' Congress? At first the careless reader interested in veterinary progress might think so. But see how great the disappointment will be! Who, according to the gentlemen from South Carolina and from Virginia, is to be entrusted with this enormous task and tremendous responsibility of organizing schools of veterinary science in the United States? Is it one whose special ability, peculiar education, national reputation as a veterinarian or as a teacher, has pointed him out as THE one who might attempt the undertaking (if there is such a one daring and conceited enough to do it alone)? No, it is one who—whether justly or not, we cannot say—has made himself a name as "a horse tamer," one who is said to be "an uneducated man, a cheeky pretender, and a non-graduate." Is not our excellent contemporary right when it says, "Smother them"? Yes, do so, and do so as well to all who ignore the true purposes involved in the establishment of veterinary schools, if the work which such institutions will do is ever to be of any use and advantage to our people and to the profession.

Veterinary education has as yet received no assistance from the General Government; veterinary graduates have, it is true, occasionally received at its hands, in some departments, recognition by receiving appointments to fulfil some special duties, but with them non-graduates have also been associated and placed upon the same level. The army has a regulation by which none

but regular graduates can occupy positions as veterinarians in the ranks, but this regulation is comparatively a dead letter, as irregulars are yet attached in such capacities to some of our regiments of cavalry; and yet from day to day the importance of veterinary science is impressing itself more and more upon the public attention, and the question as to the attitude of the General Government to the subject is growing more and more urgent. Is not this an auspicious opportunity for the authorities at Washington to take the work in hand by recognizing the resolution of the National Farmers' Congress? It is not a new question nor a new subject. For years the establishment of a National Veterinary School has been advocated, not by farmers, agriculturists, or Representatives, but by the very ones who were acquainted with the necessity and the importance of the work, who have no "axe to grind" and nothing to gain but to benefit the country and elevate the profession—and those were veterinarians. It is a subject that cannot remain much longer ignored. A National Veterinary School will yet impose itself upon the General Government, with the same claims as a necessity as account for the existence of West Point or the Naval School. If these latter will furnish means to defend the country in time of war, the former will properly prepare men to protect her agricultural interests, her live stock—that is her national wealth—in the time of peace.

Contagious Pleuro-Pneumonia in Pennsylvania.—"To my knowledge, there is no pleuro-pneumonia in the State," was about the answer given by Mr. Th. J. Edge, the Secretary of the Board of Agriculture, who, since 1879, has had the work of eradicating that disease from the Keystone State in charge, and yet veterinarians knew better—and right they were. To-day the question is no more in doubt. The disease prevails there. It has been found in carcasses of animals killed for consumption, and also in living animals, which were under the treatment of a quack. To what extent the disease may have spread since the inauguration of the work carried on by Mr. Edge is not yet known, but the investigation which is to be made by the proper authorities (veterinarians) will soon determine it, and meanwhile the veterinarians of Pennsylvania have passed the following resol-

ution at a meeting they held at the request of the Governor, viz.:

Resolved, That we heartily recommend the Governor of this Commonwealth to accept the co-operation of the national authorities in the investigation of the disease known as contagious pleuro-pneumonia. And that we further recommend that the territory for a distance of ten miles in all directions from the City Hall, Philadelphia, be placed under a thorough investigation, said limits to be under quarantine.

RUSH S. HUIDEKOPER, President.
W. HORACE HOSKINS, Secretary.

Drs. Trumbower and Rose, of the Bureau of Animal Industry, have reported to Philadelphia, and are preparing to work in the proper direction.

ARMY VETERINARY LEGISLATION.—At the request of Dr. D. Lemay, of the U. S. Army, we publish a copy of another bill which is to be presented to Congress for the reorganization of the veterinary service in the U. S. army. Several bills, we believe, have already been framed and found their way to the Senate and House of Representatives, and all must hope that something will be obtained soon, securing a better organization of that important branch of the military service. We have repeatedly called attention to the importance of the subject, and published all that has come to us from all interested parties. One difficulty in drafting a bill which will command attention too often arises from the tendency of those who write them to make them too long, and in making provisions in the bill for matters of detail which are already provided for by the rules and regulations of the service, or already existing laws. This last bill, though quite lengthy, seems to have avoided that error, though probably not as much as the bill (which we believe is already in Washington) recommended by the Committee of the U. S. Veterinary Medical Association. The opinions which accompany the draft of the bill show the importance of the subject and from the names of the signers, it is pretty evident that our friends of the army are justified in the hope of their claim being realized at an early date.

UNITED STATES VETERINARY MEDICAL ASSOCIATION.—We are informed per notice of Dr. Michener, Secretary, that the semi-annual meeting of this Association will take place this year in Baltimore, on

the third Tuesday in March. It is to be hoped that a large gathering of the members will take place, as we understand our friends in that city *hospitaliere* are making great preparations for the reception of those who will attend. Every effort will be made to render the meeting pleasant and interesting.

ORIGINAL ARTICLES.

ELECTRICITY IN MEDICINE.

A paper read before the Ohto State Veterinary Medical Association by Dr. W. J. Torrance.

Mr. President and Gentlemen:

It affords me much pleasure to endeavor to fulfill a privilege granted me by the members of this Association—namely—the privilege of addressing you.

When I announce the subject of my paper, "Electricity in Medicine," you will surely pardon its brevity and my utter incompetence to deal with it.

Electricity has as yet scarcely received its merited consideration and application to the healing art, by our medical confreres, the human physicians, while veterinarians have shamefully ignored it as an essential factor in their education. For this reason I feel that I am looking in the dark in my present effort to introduce a subject so undeniably in its infancy and so little practically known to myself and to our profession. And while these assertions are made, we cannot but admit that the development of the science as applied to medicine and surgery has by no means remained at a standstill during the past ten years: for new means have slowly been established for its application in various diseases and deformities, until, to-day, it—the mysterious electrical fluid—is viewed by some of the most competent judges as a potent therapeutic agent.

Notwithstanding its undoubted efficacy, it is surprising that there still remains such a large class of physicians who rarely employ electricity in practice, and are satisfied to sit quietly by in ignorance and await its development in the hands of more skillful and more enterprising practitioners.

There is no plausable reason why electricity should not have advanced as far in medicine as it has done in the mechanical arts, and still less reason why it should not have progressed as far in veterinary medicine as it has done in the human art.

What student of medicine would profess to have a knowledge of materia medica who had neglected to study such important drugs as opium or alcohol?—and yet electricity cannot be said to occupy a position in therapeutics second to that accorded either of the drugs above mentioned. Some of its achievements in medicine and surgery undoubtedly stand unrivalled. And we must remember that the reputation which it has earned has been gained in spite of the most fearful obstacles. It has seldom been applied except as a *dernier* resort or in chronic cases, and has then been instituted with a shameful lack of confidence and applied with an equal lack of science.

Bartholow justly says of it "there is no effect more certain than the power of galvanism to relieve pain."

Austin Flint recommends it in the diagnosis of the paralysis and in the treatment of diseases of the internal organs as well as in chorea, myalgia, neuralgia, neuritis, amaurosis, the neuroses, muscular-atrophy, etc.

But we need not depend entirely upon our medical confreres for an honest exposition of its efficacy. Veterinary surgeons in foreign lands have long recognized its utility, and when in our country such notable authorities as the illustrious Law and others, accord electricity a therapeutic recognition—must we not feel depressed to think that we are still satisfied to consider our offices equipped without at least a galvanic and a faradic battery in them.

Among practitioners we have some enthusiastically in favor of this agent, some lukewarm advocates and an enormous number of absolute disbelievers, who still cling to their ancient forms of medication and stubbornly argue the inefficiency of all new means. The answer to these is the time-told response to skepticists, "that there are still some learned men who maintain that the earth is flat and that the sun revolves 'round it once in twenty-four hours: but for every one of such there are thousands who know better."

But while the class of disbelievers is growing smaller the "advocates,' are gradually augmenting in numbers and are striving to abort electricity from the field of charlatanry and to elevate it to its legitimate rank in medicine.

Again the fact that electricity and magnetism are empirical strongholds is no excuse for their non-recognition by scientists.

I shall not discuss magnetism save to say that it bears a strange resemblance to electricity, that it may be utilized in the same way, that its curative repute is not to be ignored and that "temporary magnets" are an essential factor in the construction of complex electrical apparatuses such as the Dubois Reymond Induction Coil, &c. &c. A magnet has the power of electrifying while electricity has the power of magnetising. A magnetic battery consists simply of a number of magnets bound together with their like poles in the same direction and may be so constructed as to form a constant force.

Magnetism has been employed with considerable success in hysteria, neuralgia, anasthesia and chorea, and it is possible that it may yet be skillfully utilized in the extraction of foreign metals from the eye and other delicate organs.

A few short notes on "electro-physics" and "electro-physiology" will be pardoned, even though randomly delivered, when it is considered that I shall not burden you with the details of their theoretical application to disease.

Electricity may be defined to be a powerful physical agent, morphologically unknown tho' supposed to be a fluid, the existence of which is made known chiefly by attraction and repulsion and by its luminous and heating effects. Its action is excited by heat, chemical action, friction and magnetism. The electricity is termed 'static' in contradistinction to 'dynamic' because it is not in a state of high tension.

It is supposed that there are two kinds of electricity pervading all bodies, positive or vitreous, and negative or resinous. In the unelectrified condition these fluids just neutralize each other; but the equilibrium may be disturbed by physical agencies.

Static electricity produces much the same physiological phenomena as the ordinary faradic current and has been utilized in

the form of electric belts and by the local withdrawal of sparks in organic diseases. (Electric belts ought not to be ignored by veterinarians). It is painless even when producing the strongest muscular contractions and receives the highest therapeutical recommendation from such authorities as Dr. Golding Bird, who records the curing with it of thirty-five out of thirty-six cases of chorea, which had already baffled all medical treatment and been pronounced incurable. Static electricity is generally utilized in the same class of cases as faradism, and with equal success. Its painless character should render it advantageous in equine practice: but statical machines possess one disadvantage, that of being inert, or irregular in action during the heat of summer.

The law that unlike electricities attract and like repel requires no explanation or allusion save to say that it accounts for the institution of a current when the poles of an ordinary magnet are applied to the animal body.

Metallic and other materials vary greatly in the conductivity of electricity, but bear practically the same relations to one another as in the transmission of heat. Silver, water, acids, charcoal and most of the metals are good conductors. Platinum is a remarkably poor one, as is also dry air. The fluid tissues, the water salts and metals of the animal body are good conductors and ought to convey the peculiar fluid rapidly: but other circumstances may modify this result. Having convinced myself that the subcutaneous connective tissue is the most efficient conductor, I generally utilize subcutaneous needle electrodes with long conjunctive wires in equine practice. Electricity, however, will always choose the parts of least resistance. The hair of the horse or dog is a poor conductor and an obstacle to electro-therapeutical practice. The horn of the hoof, strange to say, offers but little resistence to the current.

Induction is the influence which an electrified body exerts over another body placed near but not in contact with it, in decomposing its neutral electricity, attracting the unlike to the proximal end and repelling the like to the distal extremity. An "induced current," therefore is always of an opposite character to the "primary," and herein lies the difference between faradism and galvanism.

In practice it must be remembered that the electricity does not penetrate deeply into the interior of bodies, but seeks the surface, therefore the greater the surface the greater the amount contained; and further, that it has a marked tendency to accumulate and discharge in points. Possibly the shoes of the horse are the discharging points and the earth the receiver. In such a case "insulative" foot plates or floors may be required in equine electro-therapeutical practice, while the conducting powers also of the different forms of litter require some consideration by the veterinarian.

As a suggestion to those building or equipping veterinary infirmaries in large cities, it might be mentioned that there is no reason why the electric current of ordinary lighting wires should not be introduced into these hospitals.

This current is a "constant current" easily regulated in quantity and quality by mechanical fixtures, so as to be utilized for almost all therapeutical purposes, including the galvano-cautery. With such a constant electrical supply as this an equipment of suitable electrodes for permanent use is but a small item of expense, while the dangers of the system are easily minimized in these days of advanced science.

Again, "the strange fluid," like all other fluids, seeks its own level, and it is therefore customary to speak of "positive" and "negative," potentials. Two agents charged of different potentials act positively and negatively to each other.

I shall not attempt to describe any of the countless varieties of batteries; they are too numerous and too complex. The cells of certain fishes even are looked upon as battery cells, and justly so, for they possess the power of magnetizing soft iron and of deflecting the galvanometer.

Galvanism and faradism require some allusion.

The galvanic, voltaic, or chemical current is generated by contact of dissimilar bodies in the presence of heat or chemical action. Thus, when two metals are placed in a liquid which acts more strongly upon the one than the other, a difference of their "potentials" results, and if now they be connected by metallic wires the electricity flows from the higher to the lower potential:

and the equilibrium is restored, but chemical action continuing the constant current is the result. Such is the galvanic circuit, and in the ordinary zinc and carbon batteries we must not forget that the current flows from the metal most acted upon—the zinc—thro' the fluid to the carbon and from thence through the connecting wires to the zinc. The carbon, therefore, is electro-negative to the zinc, and its pole or discharger is the anode or positive pole, and the current flows from the positive pole of the carbon to the negative pole of the zinc. The property of creating differences of potential is called electro-motive force, and is truly an imaginary force moving an imaginary fluid. The resistance offered by the conducting wires is universely proportional to their sectional area, and directly to their length and varies with the specific conducting power of the metal used. Metallic resistance to a constant current is the principle engaged in the production of luminous jets, the galvano-cautery, &c.

Electrical luminosity has been utilized in therapeutics, surgically upon the larynx and similiar organs in the hands of specialists.

The electrical density of a current refers to the relation existing between the area of the substance traversed and the quantity of the fluid disengaged.

The human epidermis, as has been mentioned of the hair of the horse, offers a strong resistance to the current; but this may be partially overcome in practice by increasing the size of the electrodes, the pressure and length of application, and by the use of a saline solution upon the surface. For medical purposes it is advantageous to connect "cells" in "series," rather than by superficial arrangement.

Electrolysis is the electrical separation of the elements of a compound into its individual electrolytes, none of which can be further decomposed. Solution favors electrolysis; yet it is doubtful whether the tissues of the animal body, semi-fluid as they are, exhibit in any degree the electrolytic phenomena of the gathering at the anode or positive pole of O. chl., the acids and electro-negative elements, or at the catteocle of electro-positive elements, such as H, the alkalies and the metals. The elec-

tro-surgical treatment of aneurisms has as its basic factor of success the power of the anodic needles to coagulate the blood.

It will be found in practice that galvanism is the most penetrating, painless and sedative current (therefore its practicability in equine practice); and further, we may yet find a distinct "specific" variation among animal species in their susceptibility or resistance to the current or currents. That different species of domestic animals possess a varied susceptibility, always more delicate than that of man, to atmospheric influences, I have had occasion to substantially demonstrate by proving the exactness (barometrically) with which sheep can foretell a storm, and also other differences of susceptibility of different breeds of that species. It is within the range of human probability that these atmospheric changes are electrical, and that animals bear a very varied acuteness of sensibility to electrical influences. I maintain, from that little experience which I have had in this line, that equines are more sensitive to and less tolerant of either galvanical or faradic currents than man.

In this connection I desire to substantiate these observations by the statement of Dr. Whitehead, of Ohio, which his experience has repeatedly confirmed, that animals suffering from trismus, tetanus, and similar affections, exhibit marked exacerbations of the symptoms, spasms, convulsions, etc., before a "storm," whether it be or be not preceded, accompanied or followed by visible or audible phenomena.*

The physiology of the neuro-muscular apparatus having been so extensively elaborated by electrical experimentation, a few scattered remarks, recalled by memory, upon this and kindred subjects, will perhaps be excusable, notwithstanding the fact that vivisection has been the method of obtaining our knowledge.

It may be stated generally that electric currents act as stimulents to the part at which applied and to neighboring parts. They act as nervous excitants, both reflexly and directly, and probably have numerous undefined vaso-motor effects upon the nutrition of the part, through the nervous, circulatory and sympathetic systems, which may account for the metabolic changes

* Inserted since reading this paper.

produced, and for the catalytic action accredited the peculiar fluid.

The physiology of the brain and spinal cord were little understood until the stimulation of nerves and nerve centres was instituted, electricity being chosen as the stimulating agent, on account of its cheapness, easy regulation, rapidity of action, accuracy, etc. By vivisection of frogs, turtles, rabbits and smaller animals, exposing crainal, spinal and nervous areas, such as the pneumogastric, sympathetic and other nerves, and by exposing for experimentation even the heart itself, enormous numbers of physiological facts have been deduced from the phenomena observed. These facts, like all others in physiology, have a bearing on pathology, but have not yet been practically utilized to any extent in medicine. We have learned, however, that the physiology of the heart-beat, the innervation of the iris, the localization of cerebral and spinal tracts, etc., etc., are exceedingly complex studies.

When a galvanic current traverses a motor nerve, the muscle supplied by that nerve contracts, but the contractions will only recur upon the makes and breaks of the circuit (or upon changes of the strength of the current), which, if they be sufficiently rapid in succession, will induce an "artificial tetanus," corresponding to the tetanic action of volitional muscular contraction. That an electric current traverses an acting muscle or nerve in health has long been demonstrated by the galvanometer. These, no doubt, are both caused by and causative of chemical action, and certain drugs, such as curare-varatria, etc., are known to modify or even obstruct these currents.

Sudden reversals of polarity of the electrodes induce powerful reactions; but the direction of the current has but little influence upon the contractions, for all currents diffuse in subservance to physical law. Fatigue, impoverished blood supply and lowered temperature certainly modify the contractions in a definite manner; but the altered reactions of morbid processes are indefinite. The part of a muscle excited by a current is electro-negative to all other parts, while, in a transverse section of muscle, the currents run from the equator or positive pole to the cut extremities.

For unstriated muscle the galvanic or constant current is the most effectual stimulus, and the muscle responds in its normal vermicular wave. It has been observed that stimulation of the intestinal tract with electrodes at either end produces strong contractions at the extremities, while the intervening area of intestines remains relaxed.

Cardiac muscle responds only to galvanism, and sections of it are governed by the same laws as striated muscle. By stimulation of the veins or sympathetic nerves, we find that a weak current to the former weakens the heart-beat, while a strong one quickens it, arrests it in diastole, and also arrests the respiratory movements during inspiration. Stimulation of the sympathetic, generally speaking, quickens the heart-beat.

The electrical modification of the heart-beat in febrile and other affections, however, must be viewed by even the most sanguine as a grave futurity in medicine.

Nerves are governed by the same current laws as muscles, the metabolism and evolution of heat being less marked. When a nerve is stimulated it suffers an increase of irritability at or near the negative pole termed "katelectrotonus," and at the anode a diminished irritability or anelectrotonus. The excitability of a nerve is lessened by a descending current and increased by an ascending one; therefore a nerve, whose excitability is impaired by a descending current, has it restored by an ascending. It follows from the above that we should place the positive pole of the galvanic circuit over the painful region of a neuralgic nerve.

In labial or muscular paralysis, the stimulating or exalting current is required, and the higher up we apply the electrodes the greater will be the peripheral results. Hence the origin of the snowslide or avalanche theory of nerve currents.

In the stimulation of special nerves, such as the great auricular, nervi-epiglotes, sciatic, etc., etc., for vaso-motor influences, exceptional results have been observed, which I shall not attempt to itemize, for they belong more truly to the domain of physiology.

By the stimulation of sensory nerves, we produce reflexas with or without pain. Innutrition, loss of temperature, etc., etc., as in muscles, affect the electrical phenomena of nerves.

Percutaneous galvanization of the brain produces a variety of symptoms. Faradization of the veins causes vomition and arrests peristalsis, while galvanism induces quiescence of the stomach. Galvanism of the eye, especially kathodic, induces flashes of light of the tongue and nose, subjective tastes and odors, respectively.

The fact that morbid alterations in the tissues affected their electrical phenomena gave birth to a permanent factor and practice in medical science—"Electro-Diagnosis"—which requires a comparison of symmetrical parts where disease is unilateral, and a comparison of some other part of the body whose reaction is definitely known when disease is "bilateral." In either case pathognomonic results may be obtained. Further, the seat of disease may be localized by the "thermo-electric pile," which possesses a superacute sensitiveness to variations of temperature. This fact has a bearing upon the "cerebral localization hypothesis," and upon the diagnosis of obscure lamenesses in the horse.

A few brief remarks upon electro-therapeutics and surgery will conclude this crude paper.

In practice, good results accrue from the tonic effects of the local withdrawal of sparks from the affected parts in exhaustion, debility, muscular and chronic rheumatism, stiff joints, neuralgia, gastralgia, torpid liver, dyspepsia, constipation, etc. Whether this action is entirely reflex or direct, or both, it is yet uncertain. The size of electrodes is a point to be considered. The current is stronger and more dense at the smaller electrode. For a small superficial motor point use a small electrode, with a larger one at a distance. For a larger part use large-sized electrodes close together. For a large joint or a deep-seated part, such as the bladder or brain, place large terminals on both sides of the part, so that the current will cover the area. For the stimulation of the bladder or rectum, however, I consider spinal-electralization all that is necessary, because in treating paraplegia incidental to indigestion, spinal anæmia, etc., defacation and urination will be found to be early and significant responses to the life-sustaining fluid. Avoid unnecessary pain by a gradual increase in the strength of the current and by a firm and uniform pressure of

the electrodes, and by so doing you will soon become convinced that the idea that a monthly or even weekly continuance of the electrical medication is essential to a cure, is absolutely fallacious. In nervous diseases periplural treatment often cures or palliates the symptoms of centric lesions.

Local and general faradization have been utilized in a great variety of diseases. I have used general faradization in spinal meningitis, and local in pharyngoplegia, using the MacIntosh battery. In the first case, running the current from the occiput, or spine, to the perineum; in the second, from the occiput to the pharynx, and with prompt success.

Galvanization of the recurrent laryngeal nerve and the local withdrawal of sparks from the region of the larynx have been tried by veterinarians, with varying success, in the treatment of roaring (a cure must depend upon the cause). Galvano-faradization may be employed where both currents are indicated simultaneously.

All varieties of paralysis have been treated by electricians, and generally with good results. It must be borne in mind, however, that internal medication often assists the electrical fluid in attaining its successful issues, and probably at times counteracts its beneficial results where failures are recorded. Authorities have agreed in human practice that interrupted kalteodic galvanism applied to the part in paralysis is most useful, while local anasthesia yields more truly to faradism.

In the treatment of spasms or cramps the indications call for sedative anodic galvanization to the part, with stimulation of the antagonistic muscles.

Hyperæsthesia, pain, and neuralgia are undoubtedly benefited by the application of the galvanic anode over the seat of irritation, and palliation at least may be obtained where deep-seated organic lesion underlie the symptoms. Functional disorders of the brain may be treated directly by percutaneous cerebral galvanization, or by reflex faradization. But in almost all cases we may accept it as a general rule not to institute electrical stimulation until inflammation has been subdued.

The same remarks apply to the spinal cord which has been

electrified in hemiplegia, paraplegia, paraparesis, chorea, progressive muscular atrophy, ascending paralysis, lead poisoning, affections of the pelvic viscera, etc., etc., etc., by both veterinarians and human physicians, and with kind results. 'Tis possible that that obstinate form of impaction leading to paralysis of the lesser colon, and so frequently death of the horse, may be overcome by scientific electralization.

Viewing tetanus as a functional increase of the irritability of the great nerve centres, we are justified in theoretically concluding that percutaneous-cerebral anodic galvanization would be at least beneficial, if not curative. But the empirical use of the electrical fluid in this and similar affections must be futile and perilous to the patient, as well as degrading to the practitioner.

In labial paralysis and labio-muscular atonicity in the horse, stimulation of the portio dura is useful and easily instituted.

Rheumatoid colteritis, with or without structural changes, is said to yield to galvanism.

Many abdominal affections have been treated in the human subject by percutaneous applications; but the difficulty of such practice in veterinary medicine is a formidable objection, which may also be said of the electric and magnetic belts in use.

Diseases of the genito-urinary organs and such general diseases as anæmia, chlorosis, etc., attest the efficacy of electrical medication. Electrical surgery seems to have, as its inducing features to veterinarians, the absence of pain and hemorrhage in the amputation of the tongue, penis, etc.

The electrolysis of aneurisms, removal of warts and malignant tumors, stimulation of ulcers, absorption of enlarged glands, and kindred operations are surgical applications of the fluid, upon which I expect to receive some practical information from some of the older members of the profession here to-day, and I shall depend on these gentlemen to describe in detail the uses and results of usage of the galvano-cautery.

In conclusion, gentlemen, let me thank you for your kind attention, and ask that you will pardon the feebleness of this paper, and make up for its inefficiencies by a hearty after discussion.

DEFECTS OF THE PRESENT U. S. ARMY VETERINARY SERVICE.

By D. Lemay.

The aggregate pecuniary value of army animals is nearly three million dollars ($3,000,000).

Two-thirds of these animals (value $2,000,000) are not only utterly unprovided with veterinary attendance or supervision, but are left to the ignorant and often brutal treatment of soldiers and drivers, resulting in immense loss of public property.

Large losses occur annually, and great waste of veterinary drugs, instruments, animals, etc., there being no veterinary specialists in charge of the department, and the business of purchasing, feeding, shoeing and general management of horses being regulated by "Boards" composed of officers lacking the necessary technical knowledge or education to fit them for the position.

United States Army officers, unlike their European confreres, receive not the slightest instruction in veterinary matters, and yet they are frequently in charge of large numbers of public animals, being obliged to make rules for their sanitary well-being and even regarding their medicines and veterinary attendance.

Army horse-shoeing "according to tactics" is "foot-butchery, hoof-mutilation, and destruction." It permanently cripples and renders useless hundreds of valuable horses and mules each year.

The condemned and death lists amongst animals present, annually, a far higher percentage than that of any other civilized army, requiring a yearly appropriation of two hundred thousand dollars ($200,000).

Animals, fit for military purposes, are becoming scarcer, of greater pecuniary value, and more difficult to procure from year to year.

Large numbers of animals, anatomically unsound, physically unfit from bad conformation, etc., are annually purchased, from want of professional veterinary examination previous to being bought.

The present position of Army Veterinarians, their low relative rank, poor pay, utter want of prospects, promotion, or pension for long services, injuries or wounds, to which their professional

duties render them so liable, is such as to deter respectable, efficient, or talented professional men from entering, or, having entered, remaining in the service.

The Board of 1879 decided that "all Army Veterinarians must be graduates of reputable colleges or schools," nevertheless four of the best appointments are, at present, in the hands of quacks and empirics.

On the arrival at their post of ninety (90) remount horses, purchased in 1885, a casual professional examination revealed seventeen (17) of them affected wtth various chronic diseases, which not only rendered them worthless for military purposes, but reduced their pecuniary value at least seventy-five per cent. below what they cost the Government.

Appointments as Army Veterinarians are in the hands of regimental commanders, who, from individual idiosyncrasies, frequently have difficulty in retaining them, and thus cavalry regiments, whose animals may be valued at one hundred and fifty thousand dollars ($150,000), are frequently, for long periods, without professional assistance, often resulting in serious losses. Instanced in the First Cavalry, in 1876, where an outbreak of "glanders" lasted two years, causing the sacrifice of several human lives as well as animals, and was only finally suppressed on the appointment of a skillful veterinarian, who found it necessary to order the destruction of horses and property valued at fifty thousand dollars ($50,000).

The Act of Congress specially states "that each cavalry regiment shall have one Veterinary Surgeon," nevertheless many regiments are frequently, for long periods, not so provided.

The Board of 1879 recommended as a measure of economy that a Veterinarian be stationed at every large garrison.

Veterinary education comprises a three years curriculum, an expenditure of about three thousand dollars ($3,000), and more subjects are as minutely studied than in human medicine, viz.: botany, mineralogy, physics, chemistry, analysis of food and water, physiology, histology, pathological anatomy, general pathology (human, equine, ovine, bovine, canine and feline), medicines, therapeutics, soundness of animals, dietetics, buying and selling,

transportation, horse-shoeing, clinics, obstretrics, surgery, forensic medicine, veterinary police and contagious diseases, meat inspection, animal conformation, operative practice, microscopy, sanitation, stabling, examination of forage, grain, water, etc., hygiene, skin diseases, ophthalmology, helminthology, jurisprudence, etc.

The Army Veterinarian is paid less than the signal service soldier, ordnance sergeant, wagon boss, mule packer, post blacksmith and carpenter, Q. M. clerk, general service clerk, headquarter messengers, etc., etc. He has only the rank, quarters and social status of the enlisted man, consequently his professional suggestions and instructions are neither received nor executed with the respect and promptness they deserve.

Amongst all other branches of Government veterinary service (the Bureau of Agriculture and various State veterinary officials) the Veterinarian is recognized, treated and respected as a professional representative and a gentleman, with stipend from two thousand dollars ($2,000) to five thousand dollars ($5,000) a year.

The Veterinarian has no control over those who should be his subordinates, viz.: the farriers and blacksmiths, consequently his instructions are ignored or carelessly performed, his treatment of sick and lame animals are frequently countermanded and interfered with by the veriest tyros and smatterers in veterinary matters.

The Army Veterinarian's pay, $75 for juniors and $100 for seniors, per month, is not sufficient to supply more than the bare necessaries of life, as army living is high and expensive. In traveling, he is only allowed the same amount of baggage as an enlisted man, and consequently must dispose of his effects when leaving and purchase others at the next station. His travel pay stops on his arrival at his destination, although he is frequently compelled to remain at hotels, etc., for long periods, through scarcity of quarters.

The Quartermaster General in his annual report of 1884-5, states "that Veterinarians are practically without quarters."

As a professional representative and gentleman he cannot associate with the enlisted men, more particularly if he wishes to command the respect necessary to the proper performance of his duties. His present status and pay debars him from the society of officers and their families.

In all European armies, including those of England, France, Germany, Russia, Italy, Egypt, Sweden, etc, etc., the veterinarian is a commissioned officer, ranking from Lieutenant to Colonel; some of those countries are so particular in this respect (France and Germany) that they graduate and educate their own veterinary cadets, and in all of them their veterinary services are organized into special corps and departments.

The British War Department controls thirteen thousand six hundred (13,600) animals and employs over two hundred (200) of the most scientific and talented veterinarians, ranking as commissioned officers, from Lieutenant to Colonel. The United States War Department controls over fifteen thousand (15,000) animals, and employs but fourteen veterinarians, ranking as enlisted men, hence none but the very refuse of the veterinary profession will remain in the army under the present humiliating conditions, resulting in great loss of public property, and detriment to the military service.

Troop horse-shoers and farriers are detailed to these duties without the slightest intelligent instructions, and are left to their own ignorant, injurious and often cruel devices, resulting in ruining, crippling and poisoning public animals, large numbers being permanently and prematurely rendered useless, and sold as unserviceable and unfit for further service from the above easily preventable causes.

The establishment of a veterinary hospital, pharmacy and shoeing shop in each post, under the special control and supervision of a veterinarian, would cause an immense saving, preventing the present exhibition of enormous and poisonous doses of drugs by ignorant farriers; the ruinous foot butchery and foot mutilation now carried out by horse-shoers, and for the isolation of sick animals. The latter are now retained in their usual stalls, in the midst of their companions, hence the frequency of outbreaks of contagious diseases amongst army animals.

Approaching service in large cities, and neighborhood of the centres of contagious diseases, together with the removal of military animals from soft prairies to hard roads and pavements, renders the establishment of an army veterinary department, and induce-

ments for talented veterinarians to enter and remain in the service an urgent necessity and a measure of economy. The present disgraceful state of army veterinary matters savors largely of apathy and negligence of the best interests of, and detriment to, the various branches of the service.

The formation of an army veterinary corps, with its commissioned officers, as in all European countries, would prove a great economy and benefit to the best interests of the service. It would reduce the present high mortality and yearly animal condemned list, arising from causes not inquired into. It would insure the purchase of sound and proper animals, prevent the present waste of drugs and other veterinary materials, and provide rational instructions for veterinary nurses and horse shoers. At present, certain stables, posts, regiments, batteries and garrisons may have an unusually high death rate, or percentage of sick or diseased animals, and continue so, without the slightest attention or inquiries as to their causes, or measures being undertaken for their removal, preveution or recurrence.

Army veterinary service is and always had been a vast series of wasteful and extravagant experiments in drugs, animals, horseshoeing, etc., etc. The Army and Navy Journal says: "It costs five dollars, ($5.00) per horse, per annum, for army veterinary service, against fifteen cents per horse, per annum, at the American Veterinary College, New York."

As well might combatant officers, and with equal chances of success, attempt the management of that admirable corps, the Medical and Hospital Department, as is now obtained, at their hands, in army veterinary affairs.

REPORTS OF CASES.

FRACTURE OF RADIUS—AMPUTATION.

By H. B. Adair, V.S., of Kansas City, Mo.

Jan. 24. I was consulted in regard to a mare that had fractured her leg about Jan. 20. The mare was fifteen years old, and blind in both eyes, and was safe in foal to Governor Wilkes. She was at Waterloo, Mo. (about thirty miles from Kansas City);

owner didn't know anything about the case, only from a telegram which stated that her leg was broken, and he wanted to save the foal if possible. I went out on the evening of 25th, and found the mare lying on her right side in a log stable, and the temperature about 10° below zero; left front leg fractured at upper part of radius, and a part of the bone protruding through the skin on the internal side. The leg was cold and had very little life left in it,—mare suffering considerably. Above the fracture the leg was swollen to twice its natural size. I concluded that there was only one thing to do to save the mare, and that was to amputate the leg, which I proceeded to do by securing the three sound legs with a rope, and administered an anæsthetic in the form of chloroform; then divided the soft structures with a large scalpel, letting the internal and external sides form the flaps; these I pressed upwards, and with a bone saw cut the radius above the fracture about three inches from its proximal end, and secured the posterior radial artery; cleansed the parts with carbolized warm water, and closed the flaps together with strong tape and a large speying needle, leaving drainage before and behind where the flaps came together. Revived the mare by sponging mouth with cold water. After half an hour raised her by the use of slings; only kept her up for a short time; gave her a good bed, and left her until morning. When she was raised she took some water, and wanted to eat; had no pain, and was comparatively quiet. I left orders to have the leg dressed every day, and to let her down at night, and feed her anything she wanted to eat. I heard nothing more from her until Feb. 9, when the owner stated that she was eating regularly every day, and the wound was looking healthy; expected her to foal a live Wilkes colt before two months.

INQUIRY ON FOUR FATAL CASES.

By H. Neher, D.V.S.

I wish to report to you four cases that have come under my notice within a short time. The first one was on Sunday, January 29, and is as follows: The horse, "Heavy Draught" taken suddenly ill just after coming in the stable. Symptoms on the

start similar to spasmodic colic, no rise in temperature of any account, but seemed to suffer intense pains at intervals. I concluded it to be spasmodic colic, gave a physic ball and morphia hypodermically, watched him for a time and after he came under the influence of morphia, I attended to other calls. When I arrived home found a message to "come and see the horse, as he was very much worse." I went and found the animal standing shivering, respiration hurried, pulse rapid but weak, expression haggard, ears and extremities icy cold, sides of abdomen wet with perspiration, temperature 103° F., pressure on abdomen not tolerated; a tendency to sag backward, and the most important symptom was a discharge through the nose of a copper colored fluid and very, very offensive; this seemed to be vomited up every little while, and in quite large quantity. Often he would sit on his haunches "like a dog;" then he would roll on his back and flex his legs on his abdomen, curb his nose on the stemum and lie in that position for a short time, then suddenly spring up, stand on his feet, hang his head and vomit. I concluded it to be gastric trouble associated with inflammation, and treated accordingly, and had the pleasure of seeing the animal regain health after a few days, but to-day seems to be stupid at times. That was case No. 1.

No. 2 was a two-year-old colt, never driven, nine miles from the other. Was taken at night, treated by a farmer, lived that night, and all next day. I was called at 7:30 p. m., went, and got history which seemed to be like case No. 1. Found the vomiting of fluid the same, prognosed death, which occurred in half an hour. Held post mortem and found the following on opening the abdominal cavity: the stomach very much distended, empty as far as food was concerned but filled partly with the fluid I speak of and partly gas. Examined it carefully but found no rupture of its coats, and on pressure could not force its contents through the œsophagus. On opening it the mucous membrane of the right sac seemed to be entirely eaten off, and its bleeding attracted my attention. I traced the intestinal mass in its order and found the small intestines very much inflamed in patches. The farther I went towards the rectum the more inflammation I found, also the blood vessels running through the mesentery proper were filled with

coagulated blood, which could be traced around the intestines in splendid shape. The liver seemed to be all right, also kidneys, spleen, etc., but on opening the thoracic cavity, the heart being taken out and excised was found entirely empty and looked as if it had been washed out, so clean it was. The lungs were patchy, healthy in parts, with spots containing coagulated blood in other parts; no fluid in the cavity at all. I reasoned that the condition of the lungs was due to breathing or taking in this fluid while inspiration was being effected.

Case No. 3. was in a horse of about 13 years old, symptoms the same. On being called got there just in time to see him expire. Held post-mortem on him and found things about as in case No. 2.

Case No. 4 was across the river in Saugerties. I was called to consult with a young practitioner, he being telephoned for on Sunday night, Feb. 5. The horse was 7 years old, 16 hands 1 in. high and quite lively. He and his mate were driven on the afternoon of the day mentioned until 5 p. m. when they were brought into the stable, rubbed, blanketed, etc. At 8 o'clock symptoms of colic appeared, the young practitioner was called for, treated him until 11:30, when I was sent for and got there 12:15, saw the case and prognosed death, which occurred at 1:5 a. m. the symptoms being the same exactly as the others I saw. Post mortem revealed the same as Nos. 2 and 3. I have looked my notes over and find nothing in them to compare with the above cases. I have read my text books through and find nothing there to satisfy me in making a proper diagnosis of these cases. In all of the cases with the exception of the colt, the horses got good clean hay and sifted oats; the colt ran on the barn yard in the day time, and was stabled at night. I write to know whether any of my fellow vets. have had similar cases, and if so what diagnosis and treatment, etc.

A QUEER CASE OF STARVATION.

By C. H. Peabody, D.V.S., Providence, R. I.

On January 20, 1887, was called into the country about eight miles to see a horse that the owner said grew poorer all the time.

On arriving found a large bay gelding 8 years old, and I think he was the thinnest, poorest specimen of a horse I ever saw alive. He would have been worth twenty-five dollars for muscular dissection. I found him on the floor of a large barn, with hay mows on two sides and board partitions on the others, with a trough of running water in one corner. The owner informed me that the boy, a lad about 12 years old, gave the animal four quarts of oats a day, and that the horse was never driven, as he, the owner, lived in town and wintered the horse at his farm, and the boy only had to turn the horse out in pleasant weather; that when he turned the horse into the barn the first part of November he was as fat as a pig. I looked at the animal's mouth and found no trouble, also saw that he drank well, fed him some oats and he ate them well. I then began to look at the surroundings and found that the hay had been eaten up as far as the horse could reach and in as far as he could get. I should have said that his lips inside and especially the upper one looked as though they were full of little ulcers. On looking at the mow of hay and pressing my hand against it it was as though one pressed it on so many pieces of wire, it was so hard and solid all around. I then took a rake and raked down some of the hay from the top of the mow and the poor animal almost swallowed it without masticating it at all. I then inquired of the boy if he ever threw down any hay from the top of the mow, and he said, "no, can't he get all he wants off of the mow?" He might as well have tried to get hay from the side of a brick house, the hay was packed in so tight and hard.

Treatment: small quantities from the top of the mow for a few days, then a good quantity, all the animal could eat. The animal made a very rapid recovery.

A NOTE FROM THE DISSECTING ROOM.

ABSENCE OF THE RIGHT INTERNAL ILIAC.

This interesting abnormality was observed in the dissection of the arteries of the right hind leg of a horse, in which the entire internal iliac was entirely absent. The termination of the abdominal aorta was made by only three instead of four branches. On

the left the external and the internal iliac were given off in the usual manner and their ramifications were normally distributed. On the right side, however, there was only one branch; a much larger trunk, about twice as large as usual, left the aorta and assuming the position and course of the ordinary external iliac, kept this dimension as far as to about an inch above the point where, in normal structures, the iliac becomes femoral. At that point a very short trunk arose which soon divided itself into two branches representing the obturator and the iliaco-femoral termination of the internal iliac. The arteries which represent the collateral of this iliac, viz.: the umbilical, iliaco-muscular, gluteal, sub-sacral, and internal pudic, left the large abnormal artery at about their usual places and assumed the same distribution and ramifications. The circumflex iliac left the trunk at its usual place.

EXTRACTS FROM AGRICULTURAL REPORTS.

LOCO WEED * (Astragalus mollissimus; Nat. Ord. Leguminosæ).

By L. E. Sayre, Ph.G., Kansas State University, Department of Pharmacy.

The Fifth Biennial Report of the State Board of Agriculture contains an article by me upon the interesting subject of the so-called *Crazy weed.* The plant is there described, and a few facts—gathered by personal correspondence with stockmen and farmers in western Kansas and in Colorado—are given.

With a view of gathering other statistics concerning the effects of the weed upon animal life, and learning more of the extent of loss therefrom, I visited, in January last, certain parts of New Mexico and Colorado, and during the year have made a special trip for the same purpose, visiting more especially the southwestern portion of Kansas, from Harper to Meade counties. The latter trip was suggested by Mr. Robert E. Steele, on the "Crooked L" ranch at Meade Center, who wrote he had a "locoed" cow which he would place at my disposal for examination if I would take the journey to his ranch.

In the present article it will be necessary to repeat some of the statements made in the last, but the information will have the

* From the Report of the Kansas State Board of Agriculture.

greater value, as it is gleaned from personal conversation with ranchmen and others in stock and cattle-raising from different sections. Having the above specific object in view, great care and much effort were used to obtain facts only.

The plant begins to appear at about Medicine Lodge, and to extend southwesterly into the Indian Territory and northwesterly through the State of Kansas. At Dodge City it was found growing abundantly in spots, although no locoed animals could be found or heard of thereabouts. Ranchmen say they have not been so much troubled with it in recent years, but scores had lost heavily from it in years past. It was ascertained from what appeared to be reliable authority, that about 500 animals have been lost in Meade county during the past five years from the effects of this weed, though occasionally a person was met with who firmly asserted that the plant in question did *not* cause the so-called loco disease. A butcher in Grenada, Colorado, who had been interested in raising cattle and horses, and seemed to be quite intelligent in his subject, most positively stated that "he did not believe one word of all that was said about the crazy weed. He had read and heard a good deal, but he had yet to see an animal becoming affected by loco. He had pastured right in it, and never lost one animal." A number of others gave like testimony.

It would be impossible in the brief space of this article to give the various and sometimes conflicting statements concerning this weed. Evidently there has been a lack of accurate and skillful observation in the matter. The great majority report that the plant is truly named, as it makes the animals not only crazy, but is sure to kill them eventually. Dr. P. Harding, of Dodge City, a veterinary surgeon, stated that at one time he was dealing quite extensively in horses, and had lost a number from what he believed to be the effect of loco. In order to satisfy himself, he performed two experiments upon horses, with the weed; the first experiment being in the field, and the next in the barn In the field he pastured two horses, both horses having a taste for loco. One of the horses found abundance of the plant in his pasture; the other horse found *none*, because it had been carefully removed

from his portion of the field. The first horse died in the pasture; the seoond recovered from the previous feeding. In the barn he also placed two horses similarly affected, and fed one with dried loco, and the other with clean hay. The first died and the other recovered.

The following summary of the effect of loco is based upon personal inquiry among ranchmen. The animal unaccustomed to the weed will not touch it as long as good feed is to be had, but after once partaking of it—driven to it in early spring by the want of green vegetation—soon comes to prefer it to any other food, and finally refuses any other, leaves the herd, and wildly searches for loco. The first effect upon the animal is hallucination. When led or ridden up to some trifling obstruction, such as a bar or rope lying in the road, he stops short, and if urged on leaps over it as if it were a rail-fence four feet high. Seemingly the optic nerve is affected; all sense of distance and dimension seems to be lost; a barn near at hand seems to him afar off, and one a mile away near by. He will go headlong against a barn or a rock, or over a precipice, as if he were totally blind. The animal will, perhaps, let one get close to him, then suddenly and wildly run away at full speed and as suddenly stop, turn around, and it may be, come right back, stop short, stare, "and act like mad."

Mr. William Smith, in the employ of Bollinger & Schlupp, ranchmen, seventeen miles south of Kiowa; Mr. D. R. Streeter, upon the "Z & Z" ranch, near Kiowa, and Mr. Steele, above referred to, are all quite familiar with the symptoms, and agree in every prominent particular concerning them. Mr. Steele gives as one of the prominent characteristics of the disease, "a stony stare." "If a sharp, quick motion is made before the animal's eyes, such as throwing up of the arms suddenly, it is likely to fall to the ground in apparent fright, as though not able to control its muscles." Sometimes a horse is seized as with a mania, in which he is quite uncontrollable and dangerous. He rears, even to falling backward, runs, or gives several successive leaps forward, and generally falls. His eyes are rolled upward until the whites can only be seen, which are strongly injected, and since he

can see nothing is as apt to leap toward a wall or a man as in any other direction. Anything that excites him appears to induce such fits, which are perhaps more apt to occur in crossing water than elsewhere, and the animal sometimes falls so exhausted as to drown in water not over two feet deep. He loses flesh from the first, and presents the appearance of a skeleton. Nutritive energy seems to be paralyzed. In the last stage he only goes from loco to water and back. His gait is feeble and uncertain; eyes sunken, flat and glassy; his coat rough and lusterless, and in general the animal seems to suffer from starvation and constant excitement of the nervous system. Sometimes also he appears to experience acute pain, causing him to run from place to place, paw and roll until he falls, and then dies in a few moments. A correspondent from Texas states, "he cannot tell when a horse is 'locoed' until he drives him very hard. After becoming heated he begins to be excited, and then the peculiar effect of loco appears."

There are two plants known as crazy weed, common in Kansas, Colorado and New Mexico—the *Astragalus mollissimus*, and *Oxytropis Lamberti*, both belonging to the natural order Leguminosæ. E. A. Popenoe, Manhattan, states he has received from different parts, as specimens of crazy weed, besides the above, the following: *Malvastrum coccineum*, *Sophora sericea*, and *Amarantus albus;* but the writer has found from personal investigation that the farmers of our own and adjacent States mean by this title, "crazy weed," one or other of the two species above mentioned. Both the Astragalus and Oxytropis are rather attractive plants, and keep their color all winter.

The Astragalus grows on high ground and rather dry soil which is also gravelly and sandy. It blooms about June, and bears a bright-colored flower, rather attractive in its appearance. There are a great many stalks proceeding from the base. These stalks are compressed, reclining toward the base, and erect and recurved above, subcaulescent, with soft, silky, villous pubescence. The leaflets usually in pairs, except the upper one (composed of from ten to twenty pairs), are somewhat densely clothed with soft, silky hairs, more woolly on the under side. The flower-stalk

is usually longer than the leaf-stalk, naked below, scapelike, bearing a rather thick spike of flowers, which have the general structure of the Leguminosæ, of a bluish-purple color.

CHEMICAL EXAMINATION.

In pulverizing the leaflets, the first portion which passes through the sieve consists almost wholly of the fine hairs which sause the pubescence to the structure. These hairs seem to constitute about one-third of the weight and over one-half of the bulk of the powder. From its light and spongy structure it is difficult to pulverize; the dust arising during the operation is irritating to the mucous membrane—not from irritating principle residing in the plant, but from the immense quantity of broken, sharp-pointed hairs carried up with it. The light, fluffy character is remarkable, being one-tenth lighter than powdered senna.

PRELIMINARY EXAMINATION.

The air-dried powder was subjected to a temperature of 102° C., until it ceased to lose weight. The powder was found by this process to contain 10 per cent. of moisture. It was then incinerated in a platurium crucible, and yielded 12.01 per cent. of ash. The ash yielded to water 25 per cent. of soluble material, and to hydrochloric acid 50.6 per cent., the residue being largely silica. A qualitative analysis of the ash gave the following bases: CaO, K_2O, MgO, Al_2O_3, Fe_2O_3; and the following acid radicals: SO_3, Cl, P_2O_5, Co_2, and SiO_2.

The powdered drug yielded to water acidulated with hydrochloric acid, 30.52 per cent. of extractive, the solution evidently containing sugar, starch, albuminoids and extractive of unknown composition, but containing no alkaloidal qualities. Petroleum ether, when percolated through the powder until the latter was exhausted, yielded, on evaporation, .8 per cent. of extract. The residue left, after treatment with petroleum ether, was exhausted with sulphuric ether, and the ether distilled off. This extract is entirely soluble in alcohol. By fusing the extract with caustic potash, and applying the usual test for vegetable acids, no reaction is obtained. The etherial extract thus obtained was 1.12 per cent. From the second residue an absolute alcoholic extract was

obtained, which amounted to 1.9 per cent. The petroleum ether extract consisted mainly of fat, accompanied with chlorophyl. The fusing point of this fat was 47.5°C.; congealed very readily, showing the presence of a higher cabonaceous fat. It gave a number of interesting color reactions. The etherial extract contained more chlorophyl and a soft resin. The alcoholic extract was not examined for proximate principles.

With a view of detecting, by a short process, any alkaloids, two experiments were made, as follows:

Ten grammes of the finely-powdered drug were macerated with a mixture of 66 volumes of ether, 5 volumes of alcohol, and 2 volumes of alcohol, for 24 hours. The etherial solution filtered off, and agitated with 15 cc. of water, containing a little sulphuric acid. The ether evaporated off. The residue, tested with Mayer's reagent, gave no reaction.

Fifty grammes were next treated with 3 per cent. of oxalic acid solution at 60° C.; the filtered solution neutralized with ammonia and evaporated to nearly a syrupy condition. This was shaken briskly with ether, the etherial solution decanted and allowed to evaporate. The residue, treated with water acidulated with sulphuric acid and tested with Mayer's reagent, as well as other general reagents for alkaloids, gave no reaction for the presence of such a principle.

Distillation of the powdered leaves from potash lye developed a decidedly unpleasant odor, but upon an examination of the distillate no proof was evinced of the presence of a volatile active principle. The above experiments were made only as a preliminary examination of the plant, as a study of its behavior to various processes merely; the writer will take up the subject more thoroughly in the future. A more exhaustive chemical examination is now in process, and will be reported later.

PHYSIOLOGICAL EXAMINATION.

Through the kindness of Mr. R. E. Steele, referred to above, there was presented an excellent opportunity to personally observe and study the physiological effects of the plant upon animals. A cow had been eating loco for the past year or so, and

had been "crazy" — suffering from the effects of the indulgence for a long time, but, since grass was becoming abundant and loco scarce on the pasturage, she had very recently been improving. This animal was placed at my disposal for examination. Dr. Harding, of Dodge City, was engaged to assist in the contemplated post-mortem, but as he was found too busy at the time, I was thrown upon my own resources. Fortunately, however, I was not without valuable assistance. Mr. A. J. Smith, a recent graduate of the department of pharmacy, who had also taken the preliminary medical course of the University, accompanied me, and we, together with Mr. Steele to do the butchering and heavy work, made the post-mortem. The animal was four years old, but Mr. Steele said no larger than she was at two years. The feeding upon loco had not only stopped her growth, but made her quite poor, and gave her a wasted appearance. She seemed stupid and debilitated, unsteady in her movements, the breathing was short and rapid, and muscular force very much impaired. Whether walking or standing, the head was unsteady and trembling. It was seemingly beyond her power to so control the muscles as to keep her head perfectly still. Mr. Steele stated that a wild stare had been in her eyes, but that had recently disappeared.

POST-MORTEM.

The blood was light, but not abnormal; having no instrument at hand, it was not microscopically examined. The paunch was in a normal condition; the reticulum and psalterium were softened and apparently diseased. Through the entire length of the intestines there seemed to be a degeneration of tissue, being on the inside peculiarly soft. Two or three perforations were observed in the small intestine. Both the large and small intestines were delicate, devoid of elasticity, and even upon careful handling in some places they would be torn or broken apart. The tissue seemed to be, as one expressed it, rotten in some places. The peritoneum and omentum were inflamed, and throughout were found tumors about the size of a pea, which were fleshy in appearance and of a fibrous nature. The pleura appeared normal, as also did the diaphragm. The pericardium was streaked with

red on the inner side, the sac containing about a pint of liquid of a pale yellow color. The heart seemed to be about one-third larger than the normal size. The mitral and tricuspid valves were inflamed around the edges. The valves of the aorta appeared normal, and just above them the serous coat was streaked with red; in other respects appeared normal. The bile was thin and watery, even after standing twenty-four hours. The pancreas and spleen appeared normal; kidneys normal; inner coat of bladder softened. The membranes of the brain were congested and adherent. The congestion may have been caused by the blow on the head previous to killing the animal. She was, however, only stunned by a light blow, and then immediately bled to death. The brain itself appeared paler than normal, but the bleeding may have caused this. The membranes of the spinal cord were inflamed and adherent. The cord itself appeared normal.

Evidently the disease was one of the mucous and serous membranes, which would account for the nervous and debilitated condition of the animal. The general diseased condition of the alimentary canal, by interfering with digestion and proper nutrition, would account for stunted growth and weakness in traveling. This pathological condition would indicate a treatment recommended by Dr. Harding, as follows:

Pulverized extract belladonna	10 grs.
Corrosive sublimate	1 to 1½ grs.
Licorice	.1 oz.
Glycerine	q. s.

Mix. Make a thin paste, and give a tablespoonful. The belladonna and mercury may be increased according to the severity of the symptoms. Opium combined with belladonna might be advantageous at the beginning of the disease. Mild and non-irritating articles of food only should be given, such as oil cake, etc. A veterinarian in Garden City recommended the application of a blister behind the ear. This might be good, as also any counter-irritant application along the spine. I am especially indebted for these conclusions and much assistance in making up this report, to Dr. Harding (above referred to), and Dr. Budd Smith, of Grenada, Col.

This examination, while it is very interesting, does not form a basis for any very positive conclusions. It will be necessary, to continue the investigation, to perform a number of like operations. It is very desirable to repeat the experiment of Dr. Harding — all of which the writer is prepared to do as soon as he is able.

VETERINARY LEGISLATION.

A BILL TO PROVIDE FOR THE PROPER ORGANIZATION, COMPENSATION AND RANK OF THE VETERINARIANS OF THE UNITED STATES ARMY.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled:

SECTION 1. No person shall be appointed as Veterinarian in the United States Army unless he be a graduate of a legally chartered or incorporated Veterinary School, College or University, and shall have passed an examination, as hereinafter provided.

§ 2. That the Army Veterinary Corps shall consist of one Chief Veterinarian, with the rank, allowances and pay of a Colonel, mounted, in the United States Army; nine (9) Inspecting Veterinarians, with the rank, allowances and pay of a Captain, mounted, in the United States Army; and forty (40) Assistant Veterinarians—twenty of whom shall be Assistant Veterinarians 1st class, with rank, pay and allowances of 1st Lieutenant, mounted, in the United States Army, and twenty Assistant Veterinarians 2nd class, with rank, pay and allowances of 2nd Lieutenant, mounted, in the United States Army. To be appointed by examination as hereinafter provided.

§ 3. The Chief Veterinarian shall be on duty at the Headquarters of the Army. He shall be responsible to the Secretary of War for the good working of the Army Veterinary Corps and proper discharge of the respective duties of all Veterinarians in the United States Army. He shall have charge of and be responsible for all veterinary supplies, compile and prepare for publication all veterinary reports, and render such other services to

the Government as may be determined necessary by the Secretary of War. There shall be one Inspecting Veterinarian on duty at the headquarters of each military department, who shall be responsible to the Chief Veterinarian for the good and proper condition of all public animals and veterinary supplies in his respective department, and shall instruct all Assistant Veterinarians that may be stationed at any post in his department, shall revise all requisitions for veterinary supplies, also all reports of Assistant Veterinarians as to animals condemned for sale or destruction, and shall report all particulars of the same to the Chief Veterinarian. He shall supervise the treatment of all outbreaks of diseases in his department, and do such other service as may be required of a veterinarian, inspecting from time to time, as his other duties shall permit, all Government animals at the different posts in his department. There shall also be an Inspecting Veterinarian as "Instructor in Veterinary Science" stationed at the Military Academy, West Point, one at the U. S. Infantry and Cavalry School, Fort Leavenworth, Kansas, one at the Cavalry School, Fort Riley, Kansas, and one at Artillery School, Fortress Monroe, Va. Assistant Veterinarians shall be on duty at such posts as shall be considered necessary by the Chief Veterinarian; shall keep a record of all animals placed under his charge, their condition, etc., and report the same to the Inspecting Veterinarian of his department at least once a month; shall have charge of and be responsible for all veterinary supplies, all lame and sick animals, veterinary hospital, shoeing of animals, farriers and blacksmiths, so far as their veterinary duties consist; shall visit once a day all stables, see that they are properly kept, and report irregularities to the Commanding Officer, and perform such other duties as relate to a veterinarian. Veterinarians shall examine all animals presented to the Government for purchase and shall pass no animal that is not anatomically sound and of proper conformation for the service required.

§ 4. Within three months after the passage of this bill, the Hon. Secretary of War shall appoint two Surgeons from the Medical Department of the United States Army and one Veterinarian, who shall be in the employ of the Government at the passage of

this bill, as a Veterinary Examining Board, with power to examine such candidates as present themselves for examination, as hereinafter provided, and to report and certify to him the names of ten (10) candidates who shall have passed the highest examination, as hereinafter provided.

§ 5. The Veterinary Medical Examining Board, as hereinafter provided, shall examine candidates by written, oral and practical examinations. The written and oral examinations to embrace the following subjects: Anatomy, Physiology, Histology, Pathology, (Equine), Pathology (Bovine), Surgery, Chemistry, Materia Medica, Toxicology, Botany, Sanitation, Dietetics, Principles of Shoeing, etc. The practical examination will embrace: Examination of animals as to soundness, age, exterior of horse with regards to points, marks, seat of diseases, conformation for different kinds of military service, etc., operations, prescribing, compounding and administering medicines, &c.

The examination for promotion shall be written and include all the above subjects and such others as shall be considered necessary.

§ 6. The examination, as hereinfore provided, shall be held at the Headquarters of the United States Army, and those Veterinarians in the employ of the United States Army on the passage this bill shall, if they desire to be examined, be allowed three months' leave of absence with full pay from their post in order to prepare themselves for such examination.

§ 7. Within one month after receipt of the certificate of the ten (10) names of persons who have passed the highest examinaation, the Hon. Secretary of War shall appoint one of the highest three of such ten (10) names so certified as Chief Veterinarian, with the rank and pay as provided for in Section 2 of this Bill, and the remaining nine (9) persons so certified he shall appoint as Inspecting Veterinarians for departmental and instruction duty, as hereinbefore provided, with rank and pay as provided in Section 2 of this Bill.

§ 8. Tne Hon. Secretary of War shall, when considered necessary, have power at any time, on the requisition of the Adjutant General and Chief Veterinarian, to appoint three (3) veterinarians

(one of whom shall be the Chief Veterinarian), who shall be in active service in the United States Army, as a Veterinary Medical Examining Board, to examine candidates for the position of Assistant Veterinarians, as provided for in Section 3 of this Bill, who shall, on the recommendation of the Chief Veterinarian, approved by the Secretary of War, be appointed Assistant Veterinarian, provided he shall have obtained not less than seventy-five per cent. at such examination, where not less than three (3) candidates were examined.

§ 9. In the event of the removal, by any means, of the Chief Veterinarian, or one or more of the Inspecting Veterinarians, their positions shall be filled by promotion, and such promotion shall be by seniority and examination, but no one shall be eligible for such promotion unless he shall have passed an examination, as hereinbefore provided, and possess the necessary qualifications, as required by Section 1 of this Bill.

§ 10. All veterinarians who, at the passage of this Bill, shall be in the employ of the United States Army, shall, if they desire, present themselves for examination for the position of Chief Veterinarian, Inspecting Veterinarian and Assistant Veterinarian, 1st class, and shall, at their own request, be granted three months' leave of absence with full pay, provided such leave of absence is for the purpose of preparing themselves for examination; such veterinarians shall have precedence over candidates who have not been in the employ of the United States Army, at such examination.

§ 11. Veterinarians in the employ of the United States Army at the time of the passage of this Bill shall be appointed Assistant Veterinarians, 2nd class, with rank and pay as hereinbefore provided, but shall hold no higher position except as hereinbefore provided.

§ 12. That the number of Army Veterinarians shall not exceed fifty (50).

§ 13. Applications for positions in the United States Army Veterinary Service (except such as are employed as such at the passage of this Bill) must comply with the same preliminaries as are now required of candidates for admission to the Army Medical Corps.

§ 14. All boards relating to Equine matters shall include at least one (1) Veterinarians as a member thereof.

§ 15. This Bill shall take effect immediately.

REVIEWS AND NOTICES.

A TREATISE ON THE DISEASES OF THE DOG. By John Henry Steel, M.R.C.V.S., A.V.D. (Longman, Green & Co., London.)

Though our English literature on Canine Pathology has for the last few years been enriched with works on the subject of no little value, there has always existed a lack of thorough modern elevation, and, while most of them have been more or less satisfactory compilations, on that account they were not on a level with the scientific progress of our age.

Mr. John H. Steel, who has already published several works on veterinary matters, has tried to fill up this gap, and well has he succeeded. His new treatise is now before the veterinary public, and all those who will read it will find in it a most excellent book, where the author not only gives the results of his own experience, but also has, in many pages, given that of continental writers. The 280 pages which form the neatly issued volume are divided into thirteen chapters, illustrated by eighty-eight wood-cuts, obtained from books well known to the profession. In the opening chapter the writer indulges in some general remarks upon the value, importance, and necessity of specialists in education, accompanied by valuable remarks upon the prevalence of empiricism — a part of the book that our American public would do well to appreciate; concluding with reference to some general disorders. Chapter second is a concise materia medicæ. In the following chapter, diseases of the blood are extensively treated, rabies amongst them. It receives careful and extended attention from the author, and the subject is learnedly treated down to the present day. Diseases of the circulatory, respiratory, and digestive apparatus form the fourth, fifth and sixth chapters, — this last being completed by an excellent appendix on abdominal surgery. The urinary and generative apparatus fill the seventh

and eighth chapters; the ninth treats of affections of the nervous system. The affections of the eye, of the ear, of the skin, as diseases of the special senses, are found in a very complete chapter, the tenth; the eleventh treats of injuries of the locomotor system. Toxicology is found in the twelfth chapter; the thirteenth being a little manual of surgery. A tabular statement of medicines for internal and external use completes this excellent work, which we without hesitancy consider as the most completed and perfect book ever published on the subject in the English language.

SCIENTIFIC HORSESHOEING. By W. Russell (Robert Clarke & Co., Cincinnat). 2d Edition.

Freely embelished with cuts and diagrams to illustrate the subjects treated, and in a practical point of view, affording many valuable suggestions.

TABLES OF VETERINARY POSOLOGY AND THERAPEUTICS. By G. A. Banham, F.R.C.V.S. (Brailere, Tindall & Co., London).

CORRESPONDENCE.

PROF. F. S. BILLINGS' LABORATORY.

Minneapolis, Minn., January 24, 1888.

Editor American Veterinary Review:

Dear Sir.—Having recently spent a few days with Dr. F. S. Billings at his laboratory in Lincoln, Nebraska, I thought it might be interesting to some to give a short account of what I saw there, also of the work done. This Laboratory at present occupies a room in the State University building, very conveniently arranged, heated by steam and well lighted, supplied with hydrant water for all necessary purposes, also gas taken from a pipe running around the room where jets are taken out wherever necessary for the purpose of heating thermostats and sterilizers, of which there is a good supply, of large size, expressly ordered by Dr. Billings, there being also a great variety of tissue specimens for coloring and for microscopical examination, with several valuable microscopes. Another room near by used as a library contains a large collection of medical works, both

ancient and modern. There is also a culture room, well lighted and heated with steam, regulated by a patent register so that the temperature can be at all times under complete control. This room contains a number of incubators and all necessary apparatus for the cultivation of germs, together with many pathological specimens preserved in glass jars. Still another large room in the basement of the building is used for the keeping of a number of rabbits, squirrels and mice for experimental purposes, several of which have already been inoculated with hog cholera, Texas fever, etc. Outside a convenient building is kept for the purpose of holding autopsies.

The beautiful experimental farm situated just outside the city limits, to which the Dr. drove me, is run in connection with the State University. Here Dr. Billings has achieved most wonderful success in his inoculation experiments to secure a preventative of hog cholera.

In a pen where hogs had been dying of cholera for two years were placed a dozen or fifteen shoats, which had been previously inoculated, and exposed as they were from these thoroughly impregnated surroundings for over three months, not one had at that time shown the least sign of affection and seemed as thrifty as any I ever saw at their age: while out of ten healthy pigs purchased from the country, where they had never been exposed, and placed in the same pen with the inoculated ones, all but one had died of hog cholera, and upon two of which we held autopsies. Each showed severe glandular affection, an ulcerated condition of the large bowel and immediately about the ileo-caecal valve, nephritis and a somewhat inflamed condition of the lungs; material taken from the spleen gave a pure cultivation of the hog cholera germ; several other lots had been inoculated in the country with equal success.

Dr. Billings is an ardent and untiring worker and the unquestioned success which has attended his investigations in the study and final development of the true germ causing hog cholera and Texas fever, within the fourteen months of his experiments shows fully to any candid and intelligent mind, unbiased by prejudice and jealousy, that his labor is not the product of a "disor-

dered brain," as asserted by our distinguished Dr. Salmon now at the head of the Bureau of Animal Industry.

Yours &c.,

J. J. Bradley, D.V.M.S.

Graduate of Northwestern Veterinary College.

VETERINARY JOURNAL WANTED.

Dear Sir.—I will pay $5.00 for the first volume of "Flemming's Veterinary Journal," either in pampelet form or bound, if it is complete and perfect. By inserting this in your next issue you will greatly oblige, Yours truly,

C. H. Peabody.

POSITION WANTED.

Greely, Iowa, February 16, 1888.

Editor American Veterinary Review:

Sir.—Will you kindly insert the following in your valuable journal and oblige Faithfully yours,

W. F. C. Smith.

Thoroughly competent and practically experienced member of the Royal College of Veterinary Surgeons, England, seeks a position to assist or manage for a practitioner. Highest qualifications and testimonials. Correspondence solicited.

Box 29, Greeley, Iowa.

OBITUARY.

A. L. Brown, D.V.S., age twenty-six, of consumption, at Stamford, Ct. Dr. Brown, after graduating in 1885, had started in that town and had succeeded in establishing himself in a good and lucrative practice when the symptoms of the disease which carried him away began to manifest themselves. He obtained some relief for a short time by rest and in visiting warmer climates, but on returning home, where he hoped he might be able to resume his professional duties, he soon was confined to his bed and died on the 18th of February. By his death the State of Connecticut loses one of her best practitioners; the profession, a worthy and good member; his parents, a loving and respectful son. We tender his family our sincere sympathies.

SOCIETY MEETINGS.

ILLINOIS VETERINARY MEDICAL ASSOCIATION.

The fifth annual meeting of the Illinois State Veterinary Medical Association convened at the Sherman House, Chicago, Nov. 15, 1887, at 11 a. m., Pres. B. B. Page in the chair. An adjournment was at once taken until 2 p. m., when the following members were present: Drs. Page, Redner, Jenks, Casewell, Martin, A. H. Baker, S. S. Baker, Spangler, Withers, Ryan, Scott, Nattress, McClintock, Delavergne, Withers, Hughes, Paaren, Quitman and Ireland. There were present also, arriving later, Messrs. Williams and Armstrong.

The minutes of the previous meeting were read and accepted. Then followed the President's annual address, after which officers for the ensuing year were elected as follows: President—W. L. Williams, Bloomington; 1st Vice-President—Jno. Casewell, Chicago; 2d Vice-President—W. A. Baker, Champaign; 3d Vice-President—A. Ziegler, Lincoln; Recording Secretary—P. Quitman, Chicago; Corresponding Secretary—S. S. Baker, Chicago; Treasurer—Jno. Scott, Bloomington; Board of Censors—Drs. Page, Withers and Stimpson.

On motion of S. S. Baker, T. L. Armstrong, of Indianapolis, Ind., was elected an honorary member.

On motion of Dr. Casewell, B. Tabbot, of Galesburg; and on motion of Dr. Quitman,—Bernard, of Serena, Ill., were elected members of the Association.

The report of the Treasurer showed a balance on hand of $53.92.

Honorary member Dr. F. S. Billings, of Nebraska, addressed the meeting in an interesting manner regarding his investigations in the etiology of swine plague, and practical means of prevention, for which he received a hearty vote of thanks.

An interesting paper on "Colic" was then read by Dr. A. H. Baker, which was freely discussed by the members present, after which the Association adjourned until 7.30 p. m.

Reassembled with President-elect Williams in the chair. Dr. Hughes read a brief paper on "Colic," by Thriepland, and Dr. Ryan read an essay on "Azoturia," which was thoroughly discussed.

The members then enjoyed their annual bauquet, which was participated in by the students of the Chicago Veterinary College, after which the Association adjourned until 10 a. m., the following day.

Nov. 16th.—The Association was called to order at 10 a. m., President Williams in the chair, when Dr. Paaren read an interesting essay on "Nutrition during Disease and Convalescence," which was followed by an animated discussion, after which adjournment was had to 2 p. m. Upon re-assembling an essay was read by Dr. Williams, entitled, "The Veterinary Profession; Its Needs and Opportunities for the Future."

Each of the essayists received a hearty vote of thanks from the Association.

Drs. Paaren, S. S. Baker and Williams, who were appointed a committee on revision and reprinting of the Constitution and By-Laws, proposed a number of material changes, and the committee were instructed to make the changes proposed and have the revised Constitution and By-Laws printed for adoption at the next meeting.

Drs. Casewell, Page and McClintock were appointed a committee on programme for the next meeting.

A hearty vote of thanks was tendered to the proprietor of the Sherman House for many courtesies, and the Association adjourned after having held one of the most interesting meetings during its history.

W. L. WILLIAMS, *President.*

COLORADO STATE VETERINARY ASSOCIATION.

On Wednesday evening, February 1, a meeting of the graduated veterinary surgeons of the State was held at the office of Dr. Charles G. Lamb, in the Chamber of Commerce, for the purpose of forming the Colorado State Veterinary Medical Association, at which meeting the following officers were elected: President—Dr. William McEachran; Vice President—Dr. A. F. Martins; Secretary and Treasurer—Dr. Charles G. Lamb.

The objects of the Association are mutual benefit and the advancement of veterinary science in this State.

The charter members are Drs. A. F. Martins, William McEachran, C. L. Smith, Sol Bock and Charles G. Lamb.

VETERINARY APPOINTMENT.

DR. WRAY STATE VETERINARIAN OF MARYLAND.

As we go to press we are informed that *Dr. W. Wray* has just been appointed State Veterinarian to Maryland.

The record of Dr. W. in connection with the stamping-out of pleuro-pneumonia is well deserving notice. During General Patrick' commission several years ago, he won his first laurels in Westchester County, in New York State, and in the last few months in Kentucky, Maryland and more recently in New York, he proved to the Bureau of Animal Industry one of its most excellent officers. His appointment to Maryland is a well deserved promotion, granted to him through the influence of the numerous friends he had made by his congenial manners in carrying through a too often difficult and unpleasant duty.

LIVE STOCK IN KANSAS.

From the Report of the Kansas State Board of Agriculture the following statistics, showing the number of animals and their value, have been obtained: Horses, Mules and Asses, 738,594, valued at $67,319,030; Cattle, 2,261,486, valued at $45,229,720; Sheep, 538,767, valued at $1,077,534; Swine, 1,847,394, valued at $12,931,758.

The wealth of Kansas in live stock is then represented by $126,558,042.

The death record, as follows: 17,818 solipeds, 60,540 cattle, 24,867 sheep, 402,067 swine, 160,625 dogs, completed these statistics of domestic quadrupeds.