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OF THE

American Veterinary Medical Association

FORMERLY

AMERICAN VETERINARY REVIEW

Original Official Organ U. S. Vet. Med. Ass'n.

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THE AMERICAN VETERINARY MEDICAL ASSOCIATION

By

J. R. MOHLER, WASHINGTON, D. C.

AND

H. PRESTON HOSKINS, DETROIT, MICH.

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LIST OF ILLUSTRATIONS

INDEX OF AUTHORS

INDEX OF SUBJECTS

Papers:

Clinical and Case Reports:

Abstracts:

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J. R. MOHLER, Editor, Washington, D. C.

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ST. LOUIS, A PRACTITIONER'S CONVENTION

AS PLANNED, the fifty-ninth annual meeting of the American Veterinary Medical Association, which was held at St. Louis, Mo., August 28 to September 1, 1922, was truly a convention for the entertainment and instruction of the private practioners of North America. The interest manifested in this convention is evidenced by the fact that there were members present from South America, from the Philippine Islands and from Canada, as well as from almost every State in the Union.

President A. T. Kinsley called the convention to order in the ballroom of the Planters Hotel promptly at 10 a. m., August 28. The invocation was made by Rev. Dr. William Crow, pastor of the Westminster Presbyterian Church of St. Louis. Hon. Henry W. Kiel, Mayor of St. Louis, officially welcomed the Association to the city and related many interesting experiences and spoke encouraging words as to the future of our profession. A happy and entertaining response to the Mayor's welcome was given by Dr. Tait Butler in his usual forceful manner. President Kinsley then presented an optimistic and well considered address, which was published in last month's JOURNAL.

In the afternoon the first business session was opened with a report of the Executive Board, followed by the election of

new members, reports of the various officers and of the different committees. In the evening Dr. Kinsley held the customary presidential reception in the ballrom of the hotel, following which dancing, interspersed with vocal selections by the Armour Quartet, was indulged in.

LITERARY PROGRAM

Tuesday morning was given up entirely to the meetings of the various sections of the Association, the Section on General Practice being without doubt the best attended of the three. As the papers of Drs. Conrad and Klein will appear in this number, further mention will not be made of their interesting contents. Dr. W. L. Boyd gave a very instructive lecture on the pathology of sterility and illustrated it with many slides showing the various lesions under discussion. Dr. J. G. Ferneyhough described the practicing veterinarian as "the pillar of the profession." He urged cooperation between practitioners and those holding public offices or college chairs in order to improve not only the profession but the individual himself. Veterinarians were also urged to go before the legislature of every State and obtain legislation that would prevent unqualified men from practicing as veterinarians. Drs. C. H. Honeywell and E. J. Frick also presented very instructive practical papers on necrotic enteritis of swine and the proflavine preparations in bovine practice, respectively.

The Section on Sanitary Science and Police was likewise well attended. The subject of "flu" in swine was presented by Dr. W. B. Niles in the absence of Dr. Marion Dorset and brought about some animated discussion in which Dr. Cahill and Dr. A. H. Quinn took a prominent part. This was followed by a paper on equine infectious anemia by Captain R. A. Kelser, which was illustrated with lantern slides. The subject was thoroughly discussed by Drs. C. E. Cotton, E. A. Watson and others. Dr. Cotton brought out the point that many cases of parasitism are often diagnosed as swamp fever and warned that a diagnosis should never be made without a postmortem examination. Dr. Watson called attention to the difficulty of controlling the disease since certain animals were known to be carriers of the infection for as long as ten years without showing any symptoms. The reading of a paper on the control of equine infectious anemia, by Captains Koon and Kelser of the

United States Army, was omitted, the members present voting to have the paper appear in the JOURNAL. Dr. J. G. Hardenbergh of the Mayo Clinic, Rochester, Minn., presented an excellent paper on the value of animal experimentation to veterinary medicine, which was well received. The paper on tuberculosis in its relation to the feeding and marketing of livestock, by Prof. H. R. Smith of Chicago, Ill., was a strong plea for tuberculosis eradication. The author pointed out that there was a very large amount of tuberculosis, especially among the hogs of this country, and stated that it would be profitable for the packers to pay a premium for hogs coming from areas in which the cattle were free from tuberculosis. He also referred to the fact that the American Institute of Meat Packers was working out a plan by which its members could pay a premium of 10 cents per hundred on hogs coming from such areas. Dr. J. W. Connaway of Columbia, Mo., spoke on "Facts and Interpretations Relating to Infectious Abortion in Cattle and Swine." The author enumerated all the important facts that are known about the disease and pointed out in a clear, concise manner their application for its control and eradication, favoring certain regulatory measures, based on serological tests. In the discussion of Dr. Connaway's paper in which Drs. Kiernan, Simms and W. E. Cotton took part, some of the important facts which had been presented were emphasized.

Much interest was manifested in the meetings of the Section on Education and Research, which were presided over by Dr. E. M. Pickens of College Park, Md., in the absence of Chairman Chamberlain. The first paper was illustrated by lantern slides and consisted of a preliminary report on the differentiation of the various organisms belonging to the hemorrhagic septicemia group, by Drs. C. P. Fitch and E. N. Nelson. The authors studied 28 strains of organisms belonging to this group isolated from several species of animals and found that there was little variation in their behavior toward the sugars, all falling into Group III of the Jones classification, but serologically they separated into distinct groups which bore no relation to the species of animals from which they were derived. Dr. W. E. Cotton of Bethesda, Md., read a paper on the character and possible significance of the Bang abortion bacillus that attacks swine. He pointed out that this bacillus causes distinctly different lesions in guinea-pigs than does the *Bacillus*

abortus which attacks cattle only, and that it is probably perpetuated through both swine and cattle. Although it is assumed that the Bang bacillus which attacks swine originated in cattle, the abortion bacilli commonly isolated from cattle have not been proved pathogenic for swine. The paper by Dr. R. R. Birch and Dr. J. W. Benner of Ithaca, N. Y., on investigations on the immunology of swine plague was read by Dr. Benner and illustrated by lantern slides. The investigations showed that while a certain amount of immunity could be produced by vaccination with *B. suisepticus,* the immunity was uncertain and the animals were apt to become stunted. Immune serum was found to be somewhat more efficient, but the chief reliance should be placed in the protection of the herd against predisposing causes. The foregoing papers were discussed by Drs. Connaway, Cahill, Eichhorn and Hadley.

Dr. V. A. Moore of Cornell presented an interesting paper on "The Veterinary Curriculum; Some Suggested Changes." The essayist emphasized the importance of a thorough preliminary education and pointed out certain desirable additions to the curriculum that would round it out and correlate it with agriculture, although it would be difficult to find room for them in a curriculum already crowded. He also directed attention to the need for more uniformity in veterinary courses, making it easily possible for a student who wished to specialize in given subjects to transfer to schools giving the best instruction in them. In the discussion Drs. White and Stange explained the combined agricultural and veterinary courses given at the Ohio State University and the Iowa State College, and Dr. Klein pointed out the desirability of placing all the basic scientific subjects in the first part of the course, leaving the latter part free for the applied sciences.

Dr. A. Eichhorn, who had just returned from Europe, gave an admirable report on the status and the future of the veterinary profession in various European countries, while Major Robert J. Foster gave an instructive explanation of the Veterinary Reserve Corps. Dr. W. H. Welch, the newly elected President, read an entertaining paper on the present trend of veterinary practice, and Dr. Tait Butler discussed the relation of the veterinarian to the public. The most noteworthy address of the convention was that of former Assistant Secretary of Agriculture Ousley, which is referred to elsewhere.

Space will not permit abstracts of the many other excellent papers presented at the convention, but they will all be printed in the JOURNAL as they become available.

ELECTION OF OFFICERS

Tuesday afternon the convention again met in general session and proceeded with the interesting feature of electing officers for the coming year. Dr. W. H. Welch of Lexington, Ill., was unanimously selected as President. The following Vice-Presidents were next elected: First, Col. J. A. McKinnon, Director of the Army Veterinary Corps, Washington, D. C.; Second, Dr. J. H. Ferguson, Lake Geneva, Wis.; Third, Dr. M. C. Baker, Montreal, Quebec; Fourth, Dr. Geo. H. Hart, University of California, Berkeley, Calif.; Fifth, Dr. John H. McNeil, State Veterinarian, Trenton, N. J. Dr. M. Jacob, of Knoxville, Tenn., was unanimously re-elected as Treasurer, and Dr. Cassius Way of New York City was selected as member at large of the Executive Board. The positions of Secretary and of Editor and Business Manager of the JOURNAL were amalgamated and Dr. H. Preston Hoskins of Detroit, Mich., was selected for the combined position effective January 1, 1923.

ENTERTAINMENT

On Tuesday evening a number of banquets were held by alumni of the various veterinary colleges as well as by several other associations. Those who were not occupied otherwise were given an excellent evening of entertainment by the local committee at Forest Park Highlands, where dancing, swimming and similar pleasures were indulged in. Additional entertainment was furnished the wives and families of the delegates by shoping tours, a trip to the Observation Tower in the Railway Exchange Building, luncheon at the Hotel Statler, theater parties at the Capital Theater and the Orpheum Theater, luncheon at the Planters Hotel, and a boat ride on the Mississippi River in the steamer *Erastus Wells*. An interesting diversion was afforded the delegates themselves on Wednesday evening at the Planters Hotel in the form of a smoker and round-table conference, which was followed by a cabaret entertainment in which the Barbary Coast was temporarily transferred to the banks of the Mississippi.

WOMEN'S AUXILIARY

The Women's Auxiliary of the Association held its sixth annual meeting at the Planters Hotel, August 29. More than fifty ladies were present to enjoy the program. The meeting was opened with a prayer; the address of the President, Mrs. A. T. Kinsley, followed, after which the ladies were delightfully entertained with readings by Mrs. F. A. Lambert. Beginning July 1, 1922, the Auxiliary will loan each year $350 to a senior student in a recognized veterinary college. The 1922 loan was applied for early in the spring by a young man who easily fulfilled the necessary requirements, and the loan was made as soon as the funds were available. After placing this loan the treasurer's books showed a balance on hand of $335. Following the regular business meeting, the biennial election of auxiliary officers was held and the following newly elected officers were presented: President, Mrs. G. A. Johnson, Kansas City, Mo.; Vice-President, Mrs. R. P. Marsteller, College Station, Texas; Vice-President, Mrs. W. B. Aulgar, Paxton, Ill.; Secretary, Mrs. F. A. Lambert, Columbus, Ohio; Treasurer, Mrs. H. P. Hoskins, Detroit, Mich.

SECTION OFFICERS

On the completion of the literary program of the three sections of the Association, the following officers were elected:

Section on General Practice: H. E. Kingman, Chairman; Harry Caldwell, Secretary.

Section on Sanitary Science and Police: R. C. Reed, Chairman; Orlan Hall, Secretary.

Section on Education and Research: L. W. Goss, Chairman; E. M. Pickens, Secretary.

MONTREAL FOR NEXT MEETING

Invitations were extended to the convention to hold its next meeting at Des Moines, Iowa; Omaha, Nebr.; New York City; Montreal, Canada, and several other points. The Canadian members in attendance presented strong reasons for holding the 1923 conference in Montreal and in consequence the Association voted its acceptance of the invitation so courteously extended by Drs. Fred Torrance, M. C. Baker and others. The exact time of the Montreal meeting has not been decided upon, but it is presumed that it will be held during the last half of August.

ATTENDANCE

The last figures available showed that 503 persons had registered, about 350 being members of the Association. Undoubtedly a much larger number would have availed themselves of the opportunities afforded by such an international convention had it not been for the acuteness of the railroad strike which, with its added risks of travel, deterred many from attending. Despite the drive which was inaugurated last year for increasing our membership, there were slightly less than 200 new members elected at St. Louis.

CLINICS

Probably the most outstanding feature of the convention was the interesting and diversified series of clinics which covered two full days. Those for large animals were held at the National Stock Yards at East St. Louis and were under the direction of Dr. H. E. Kingman of Fort Collins, Colo. Sterility work was demonstrated by Drs. DeVine, Bemis and Boyd, while the poultry demonstrations were conducted by Dr. B. F. Kaupp of Raleigh, N. C. The sheep clinic was in charge of Dr. I. E. Newsom of Fort Collins, and Dr. H. B. Raffensperger conducted demonstrations of parasites common to hogs and sheep. A demonstration of tuberculin testing was given by Dr. D. F. Luckey, and at the postmortem Dr. J. S. Jenison demonstrated tuberculous lesions in all but one of the slaughtered reactors. On Thursday the clinic consisted of surgical operations on the udder by Dr. G. H. Ferguson, operative treatment of laminitis by Dr. G. A. Roberts, diagnosis of swine diseases by Dr. J. W. Joss, and surgical operations on a number of horses and mules by Dr. L. A. Merillat.

While the clinic on large animals was being held at the Stock Yards, those interested in small-animal practice were entertained at the Planters Hotel by a series of interesting demonstrations on dogs and cats under the supervision of Dr. J. T. Flynn of Kansas City, Mo. Many of these animals suffering from common as well as unusual diseases were on exhibition for the benefit of the delegates. The subject of canine distemper was presented by Dr. W. E. Muldoon and brought forth an animated discussion. The growing importance of the X-ray in canine practice was brought out by Dr. G. P. Frost, while Dr. H. J. Milks discussed the diseases of the eye. Dr. W. G. Brooks

performed several abdominal operations, Dr. J. G. Hardenbergh gave a demonstration of administering anesthetics to small animals, while Dr. R. P. Marstellar discussed the diagnosis of mange, hookworms and other parasitic troubles of the dog.

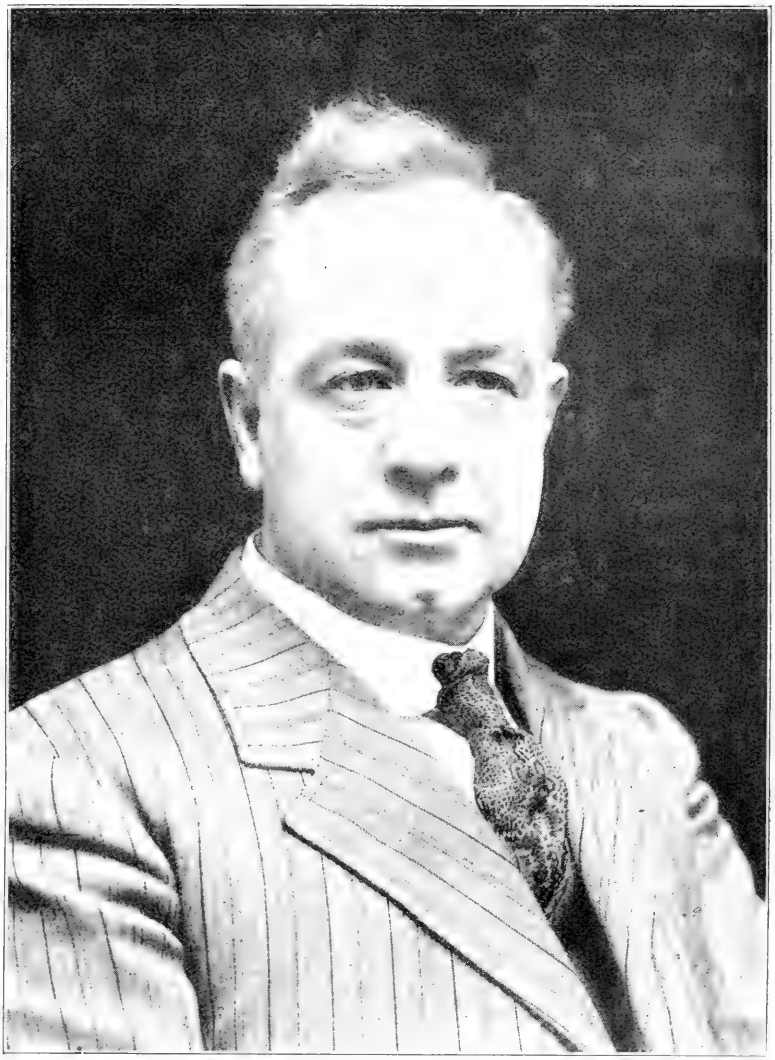
After completing all unfinished business on Friday, this highly successful and entertaining convention was formally brought to a close with the appropriate installation of the various new officers of the Association.

DR. W. H. WELCH, NEW PRESIDENT OF THE A. V. M. A.

DR. WILLIAM HENRY WELCH, better known as Harry Welch, of Lexington, Illinois, was elected President of the American Veterinary Medical Association at its annual meeting held in St. Louis, Missouri, August 28 to September 1, 1922.

Dr. Welch is well known to the veterinary profession and the laity throughout the country as a progressive citizen, a breeder of fine horses, and a thoroughly qualified practitioner. He was born May 7, 1871, near Bloomington, Illinois. His education was finished at Illinois Wesleyan University, and the Chicago Veterinary College, from which he graduated with honors in the class of 1892. Immediately following his graduation he located at Lexington, Illinois, where he has practiced his profession continuously for the past thirty years.

In connection with the practice of veterinary medicine, he took up the breeding of Percheron horses, and his farm is the home of Apollon, considered by many as the greatest son of Besique. Although Dr. Welch is a very busy man, he holds in high regard his duties as a citizen, a churchman, and a member of the various organizations with which he is affiliated. He served as Secretary of the Illinois State Veterinary Medical Association from 1901 to 1906, and was honored by his colleagues with the Presidency of that Association in 1906. Under his able administration the State Association increased its membership from 70 to approximately 300 and became one of the largest State organizations of the kind in the country. During the four years that he has been Resident Secretary of the A. V. M. A. he has worked diligently to increase the membership in his State and his efforts have figured prominently in helping to place Illinois in the lead of all other States for two



DR. WILLIAM HENRY WELCH

years in the number of applications filed for membership in the national organization.

In addition to serving on the Board of Education of his home city for twelve years and as a member of the City Council for six years, he was elected Mayor of Lexington, Illinois, for two years. Dr. Welch is an active member of the Chamber of Commerce, Vice-President and "booster" of the local Chautauqua Association, a member of the board of trustees of his church, and is greatly interested in Boy Scout work. He is prominent in Masonic circles as a member of the consistory, Chapter and Council; he has held a commission as Grand Lecturer for six years, served as District Deputy Grand Master for two years, and enjoys the distinction of Past Worshipful Master of his lodge.

The A. V. M. A. is to be congratulated on selecting such a worthy representative citizen and able practitioner as its new President. His training and experience in the fields of veterinary medicine and business, together with his energy, integrity and ability fit him for the highest office in the national association, and he regards this as the greatest among all the honors that have come to him.

COLONEL OUSLEY'S ADDRESS

THE HIGH POINT in a program of outstanding excellence at the recent A. V. M. A. convention at St. Louis was the address by Hon. Clarence Ousley, former Assistant Secretary of Agriculture, on "The Veterinarian's Relation to Agriculture."

This paper, with its clear analysis of the situation, its breadth of view, its sound judgment and its literary excellence, was most cordially received and made a deep impression. It is sure to have a wholesome and potent influence in promoting closer cooperation between the veterinarian and the livestock owner and in aiding members of the profession to rise to the needs and opportunities of changing modern conditions.

The general appreciation of the convention found expression in the following motion which was passed by the Executive Board:

"That the Editor be instructed to reprint 5,000 copies of the Hon. Clarence Ousley's address, and that one copy be sent to the editors of the leading agricultural journals of the country and sufficient number be sent to the secretary of each State

and Provincial veterinary medical association and regulatory officials of each State and Province, with the understanding that it will be printed in the JOURNAL and announced that members can get copies on request. It is suggested to the Editor that the type be kept standing for sufficient time to provide for further reprints."

Accordingly Colonel Ousley's address, which appears as the leading article in this issue of the JOURNAL, will be reprinted in separate form and distributed as directed. Members of the Association may obtain copies on request.

TUBERCULOSIS ERADICATION STIMULATES DAIRYING

WHEN the work of freeing dairy herds from tuberculosis on a wide scale was undertaken several years ago, critics advanced the belief that the slaughter of tuberculous cattle would result in a milk famine and that publicity calling attention to the disease among dairy cows would hurt the dairy business.

The criticisms received careful consideration but were not permitted to interfere with the constructive program of tuberculin testing and freeing herds from the disease. The soundness of this policy is shown by the following figures: During the period July 1, 1917, to July 1, 1922, 175,000 tuberculous cows were destroyed. Instead of a milk shortage there has been a remarkable increase in both production and consumption of milk and dairy products. Last year, 1921, milk production in the United States aggregated nearly 99 billion pounds, a noteworthy gain over the previous year. Production of butterfat likewise increased. In 1921 alone, milk cows increased 341,000, which is a figure nearly twice as great as the slaughter of tuberculous cattle during the entire five-year period.

Several hundred towns have issued regulations requiring tuberculin testing, and apparently with inspired faith in the safety and value of milk as a food, people are using more of it than at any time in the past. Frequent instances are reported in which parents place liberal milk orders with owners of tuberculin-tested herds a considerable distance away, although they could obtain milk from untested herds much more conveniently and at a lower price. Thus, in spite of various objections to the free discussion of tuberculosis-eradication problems, the evidence shows that the benefits outweigh the doubts and fears.

PUBLICITY AIDED TUBERCULOSIS CAMPAIGN

WHEN extensive campaigns against tuberculosis of cattle were launched many persons interested in the dairy business predicted that giving publicity to such conditions would alarm the consumer and reduce the consumption of milk and dairy products. But instead of producing this result, the increasing efforts to improve the health of herds have inspired more faith in the safety and value of foods from the dairy cow. Hundreds of towns have made tuberculosis regulations to provide for clean herds and to make milk wholesome and publicity has been given to the various kinds of work being done by cities, counties, states, and the Department of Agriculture. As a result of this work to improve the health of the dairy cow, statistics show that the number of cows has increased and the consumption of milk is greater than ever before.

In recent months the most encouraging development in the work of eradicating this great cattle disease has been the number of counties that have made a complete clean-up of the herds on every farm. This area work is demonstrating that complete eradication is not a dream but a practical possibility. The expense will be paid by more efficient herds and better products.

HAIR TONIC

I hear that milk and garden greens have snappy things called vitamines that give us health and strength and pep and put the ginger in our step. But what is this I also hear from folks who ought to know, that vitamines will help to make our hair and whiskers grow? I find my Jove-like dome of thought of shade not quite bereft; I'll use this happy hunch and keep what herbage I have left. The razor makes a daily trip along my chin and jowls and lip, so by my wife it is not feared that I will ever raise a beard or whiskers a la Bolshevik; but Oh, I want my hair to stick. Upon my brain pan flies would crawl if I should sport no hair at all, and those that lit upon my head would have to wear a non-skid tread. They'd slip and slither on my scalp like mountain climbers on an Alp. To ward them off my hair I'll keep though I chew lettuce in my sleep. To nourish bristles on my brow I'll buy myself a mooley cow. If milk and vegetables clinch the thatch upon our beans, so help me Pete but I will eat a lot of spinach greens.—*Robert Adams, in The Cornell Countryman.*

THE VETERINARIAN'S RELATION TO AGRICULTURE [1]

By CLARENCE OUSLEY

Former Assistant Secretary of Agriculture, Fort Worth, Texas

EVERY HUMAN ACTIVITY, like every scientific process, depends for its success upon the recognition and observance of certain inexorable principles and unvarying rules of operation. While there are phenomenal or freak exceptions to the rules of human conduct, they consist for the most part of rare individuals and rare circumstances that mean nothing to the average man. And even these apparent exceptions are themselves subject to rules which escape ordinary observation. In fact, many failures in life arise from ignorance or disregard of repeated human experiences which form a body of science of human nature. Man is a part of nature and is subject to nature's laws—social laws as well as physical laws—and the penalty of disobedience is disaster or suffering. In these truths there is both comfort and warning—the assurance that if we are true to ourselves we will succeed to the limit of our capacity, and that if we are false we will ultimately fail of the attainment to which we are entitled.

No professional or commercial activity deserves success if its major motive is not the sense of service. The wholly selfish life is bestial. It can not be even truly honest, for its entire point of view is the animal instinct to get, to take, to seize, without giving adequate return, and that instinct knows no restraint except the fear of punishment.

On the other hand, no professional or commercial activity will win respect if it does not exact a fair reward for service rendered. The wholly altruistic life beggars both itself and those whom it would serve, because no man is entitled to give or to receive something for nothing.

Between these two extremes of utter selfishness and irrational benevolence lies the middle ground of successful and happy human relations. To render true service to agriculture and to receive adequate compensation is the formula of veterinary practice.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

Every job is as big as the man who fills it is able and willing to make it. Barbers were the first surgeons, and surgery became a great profession because some barbers took the pains to enlarge their jobs. The first veterinarians were "hoss doctors," and the profession was improved by the endeavors of those who had the vision and industry to exalt their calling. The world always respects the man who knows what he professes to know, and honors the man who excels in the useful or acceptable task he undertakes. To grow a crop, to point a plow, to pitch a ball, to vaccinate a hog, to remove an appendix, to write a book, to preach a sermon—these are all worth while. The question is not whether one or the other is dignified or honorable, but whether the work is done well or ill.

Our present task is to find within this broad range and in accord with these proved rules of appraisal the relations of the veterinarian to agriculture.

In thinking of human ailments we think chiefly in terms of comfort and happiness. In thinking of animal diseases we think chiefly in terms of material values. Human life has its economic value, but it has such a large appeal of love and sympathy that we scarcely reckon the physician as an economic factor. Brute life, too, has its appeal of sympathy, but its economic value is so obvious that we reckon the veterinarian with colder calculation. We are prone to forget his great service to the human family in the prevention of the ravages of diseases that lurk in animal flesh—the anthrax, the typhus, the tuberculosis and the other fateful germs transmitted from animals to men by casual contact and through the consumption of meat and milk. A sense of gratitude for the restoration of a loved one to health may fatten the physician's fee; only the dollar saved will justify the veterinarian's charge.

Therefore, the first consideration is the quid pro quo of the service, and the farmer is famous for trying to get value received. The temptation is for the veterinarian, on the one hand, to scale his fee and to do something for profit "on the side"; and for the farmer, on the other hand, to do without the service and do his own doctoring. Here is the acid test of the veterinarian's professional stamina. Accordingly as he stands it or yields to expediency he starts on the road to professional dignity and success or to quackery and failure. Ultimately every

farmer whose business is worth having will respect the man who respects himself and his profession.

The great hindrance to veterinary success, of course, is ignorance. But I doubt whether more men doctor their animals than doctor themselves. At any rate, the only practical remedy is to contribute to popular understanding. To this end the veterinarian may well afford to make himself agreeable to farmers, and especially to put himself in the way of being invited to attend gatherings where it may be possible to discuss livestock problems. The veterinarian who does not know livestock in a practical as well as a scientific way is handicapped if not disqualified. "Love me, love my dog," is a manner of speech to signify the universal sympathy between those who know animals. It points the way of approach to the farmer's respect and patronage. A man who loves an animal, especially one who thinks he owns a good animal, is quite apt to think highly of another man who manifests an interest and exhibits some useful knowledge about the object of his affection. After all, a veterinarian is something of a missionary, and he is warranted in doing something more than sitting on his dignity and awaiting calls from an uninformed populace. Millions of animals are suffering or dying and millions of dollars are wasting for lack of his skill, and he is not to be excused for hiding his light under a bushel.

The old-time vet. used to hang out around the livery stable or the blacksmith shop, but these meeting places of the gossips and tobacco chewers have nearly disappeared, and the modern man of science must find other means of approach and usefulness.

There is a new order in agriculture. The agricultural college is more than half a century old. Two whole generations of scientific farmers are abroad in the land, and they know the value of science in every phase of animal husbandry. What is more important, there is a vast new organization of agricultural extension workers under the direction and maintenance of the Federal and State governments. This service is a part of the greatest Department of Agriculture in the world. It is a part of the agricultural college in each of the forty-eight States. These agricultural colleges are more and more becoming the leaders in veterinary education, and the Department of Agriculture and the agricultural colleges are charged with important functions of research and regulation in the livestock industry.

The Department and the colleges have done more than all agencies combined to develop veterinary science and to dignify the veterinary profession. Hence veterinary practice is intimately related by sympathy, by public policy and by self-interest with the whole great scheme of agricultural education. It is differentiated from the official organization by its independence, its self-reliance and its larger opportunities for personal gain.

Out of these relations arise possibilities of friction as well as advantage. The tendency of all officialdom is to extend its powers. Man is prone to exercise power. As individuals or as masses we all have conceit, and in excess of zeal or in sheer love of authority we are all given to aggrandizement or usurpation. This is the demonstration of history since time began—in government, in business, in industry, in religion, in every form of human activity. Out of this disposition have come all the tyrannies of the past, and the danger of tyranny is as great now as ever.

So it comes to pass here and there or now and then that the extension or regulatory official assumes to exercise more authority or to take more responsibility than the law contemplates or sound public policy advises. On the other hand, some veterinarians are prone to consider much of the public service rendered by Government agencies as an undue encroachment upon private rights and even to assume that veterinary science comprehends the whole field of animal husbandry.

To be more specific, there are numerous points of contact between the county agent, for example, and the veterinarian, which may become points of friction if great care is not exercised on both sides, just as there are such points between the regulatory forces of the State and the regulatory forces of the Nation, or between the regulatory and the extension forces of either. For that matter there are contacts of friction between the bureaus and divisions of the Department of Agriculture. All of which is to say that human nature remains human under the skin in spite of education. No rule can be framed in terms broad enough to cover all the cases that will arise in a situation so complex. The only universal formula is common sense, and even that is not fool-proof.

Generally speaking, the extension service is educational. It is charged with teaching agronomy, for example, but its workers are not to do the planting or the plowing for the farmer.

So it is the duty of the county agent to give instruction in methods of prevention of contagious and other animal diseases, and even to advise in matters of simple home treatment or to give first aid in emergencies; but he is not a veterinarian, or if so, it is highly improper for him to physic sick animals in order to save the farmer the expense of a veterinarian's fee.

Perhaps the most troublesome single point of friction between the county agent and the veterinarian is the vaccination of hogs against cholera. The treatment has become so widespread and its obvious processes appear so simple that even thoughtful men are apt to assume that anybody can do it safely. That is a fundamental error. Diagnosis is more important than treatment, and no layman is capable of correct diagnosis. Outward symptoms are undependable. Men of the deepest learning and broadest experience are oftentimes puzzled in determining the precise character of human and brute diseases in their varying and delicate manifestations, and laymen must beware lest they kill oftener than they cure. It would be quite as rational to permit laymen generally to vaccinate against smallpox. They may do it successfully nine times out of ten, and then kill somebody with blood poison. In like manner the county agent may successfully vaccinate a number of herds, but he is quite apt to be treating a few cases of worms, and he may spread hog cholera in the neighborhood. In a community without a capable veterinarian, as in a community without a physician, of course, the people must do the best they can. But the treatment of animal diseases is clearly the responsibility of the profession which is trained and licensed under the law for that purpose. A man has an "unalienable right" to let his animals die, provided he does not imperil the lives of his neighbor's animals; but no layman has a right in morals or in sound public policy to "practice" ignorance.

Happily the responsible officers of the Department of Agriculture and the colleges clearly recognize these relations, and we are coming more and more into a status of mutual respect and cooperation. It remains for the veterinary profession resolutely to maintain and to raise its standards of skill and ethics. In some States the legal requirements of skill and training are entirely too low. The educated veterinarian, like the educated physician, is discounted when the quack is licensed.

I have sometimes thought that the standards of medical ethics

are too exacting, but when I reflect upon what has been accomplished for professional dignity and for human happiness I revise my opinion and concede that perhaps the doctors know what is best for themselves and for the health of mankind. They can not be too highly commended for their large and unselfish activities in the prevention of human diseases. Their devoted state of mind in respect to the conservation of personal and community health is undoubtedly the product of rational and exalted ethics. The true scientist seeks and accepts the truth at whatever cost, and the physicians of the world seem to have found the truth of ethical human relations and to be practicing it in a rather more scrupulous degree than most other classes of men.

The veterinary profession is well emulating the example of the older profession. The true veterinary scientist sees his largest duty, and in the best sense his largest self-interest, in the prevention of animal diseases. Hence it falls upon veterinarians to take active leadership in all matters of community and local sanitation, of proper rationing, of wholesome feeding and of safe breeding. In this field there is opportunity for service and distinction second to none in the whole range of scientific development.

The veterinarian is the instrument of the conservation of animal values, and that makes him an economic factor of tremendous consequence. But most animals are food, and flesh is subject to subtle disease. Therefore, the veterinarian is also a conservator of human health. Thus in a large way the veterinarian is a vital part of the whole machinery of economic and social welfare. In a much larger way he is vital to the success of agriculture, and agriculture is the most important business of mankind. It is not only necessary to our subsistence, but at this particular time its prosperity should be viewed as a grave public concern. In our economic structure and commercial practice the farmer rates entirely too low in the distribution of the rewards of labor. The man who feeds and clothes the world should have more of the aggregate income and accumulation of the world. This is not only a matter of common justice, but it is a matter of social and political salvation. There is a deep sense of wrong among the producers of the land. It must be removed or there will be reaction. Economic injustice, like political oppression, sooner or later breeds revolt. It is appear-

ing already in sporadic outbreaks of anger and revenge taking form in rash adventures of legislation and in alliances of destructive class forces. It is essential to the social and political welfare that agriculture become more profitable. The most important single item of increased agricultural prosperity is profitable livestock on the farm. Hence in the most practical and potential manner conceivable veterinary science is to be reckoned as a powerful agency of the common weal, and the relation of the veterinarian to agriculture takes on an aspect of vast importance.

UNCLE SAM'S HEALTH ACTIVITIES

The United States Bureau of Animal Industry is described in a report recently issued by the National Health Council of Washington, D. C. This report outlines the history and development of the Bureau, its legal authority, organization, personnel, appropriations and cooperation with other agencies. The report is the eighth in a series concerning those activities of the U. S. Government which deal directly or indirectly with the public health. The previous reports of the Council include the Division of Vital Statistics of the U. S. Bureau of the Census, the Children's Bureau of the U. S. Department of Labor, the Women's Bureau of the U. S. Department of Labor, the Government Health Activities (with a chart), the Division of School Hygiene of the U. S. Bureau of Education, the Health Section of the Bureau of Indian Affairs of the Department of Interior, the Division of Welfare of the U. S. Post Office Department, and the Health Activities of the Bureau of Mines. It is planned in the near future to combine all of these reports in a single printed pamphlet, thus offering for the first time correlated, accurate and impartial data concerning the public health work of the Government. The National Health Council is a confederation of the fourteen leading national voluntary health organizations of the country, and has offices in New York and Washington. Copies of the Bureau of Animal Industry Report or of any of the others may be obtained without charge from James A. Tobey, Washington Representative of the National Health Council, 17th and D Streets N. W., Washington, D. C.

THE VETERINARIAN IN HIS RELATIONS TO THE PUBLIC [1]

By TAIT BUTLER

Editor, The Progressive Farmer, Memphis, Tennessee

MY THESIS is that the veterinarian or any other specialist or professional man is judged or appraised by the public by other than veterinary, scientific or professional standards; that his standing and influence in the community in which he lives are the results of his education and culture and his social, political and community activities, rather than the result of his veterinary or scientific knowledge or his professional activities. Hence the educated, cultured veterinarian of character, who takes an active part in the social, political and other activities of the community in which he lives, exerts a better and broader influence toward a higher evaluation of the veterinary profession and its usefulness than he can possibly exert through strictly professional activities, however profound his scientific knowledge or extensive his professional activities.

I, for instance, can not judge a lawyer by legal standards, because I know no adequate legal standard by which to judge him. Not knowing the law, I must judge of his ability in the law by some other standard with which I am familiar. Likewise the livestock owner and the general public do not measure the veterinarian by any veterinary yardstick. Opinions and confidences are formed as to the veterinarian, not only as to his general ability and character, but also as to his professional attainments, by other than veterinary or scientific standards. The livestock owner and the public can not judge the veterinarian by any veterinary standard, for having insufficient veterinary knowledge they have no such standard. They judge the veterinarian by how he measures up to their standards, which, as stated, are not veterinary standards. For instance, if my client is well informed on breeds and breeding, on feeds and feeding, and is a good judge of animal form and breed characters, he is more than likely to form an opinion of my knowledge of veterinary medicine by what he finds I know of breeding, feeding, etc. He may use this standard unconsciously, but he uses

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

it just the same, and his conclusions are likely to be accurate. It is a mistake to assume that he is not competent to judge the veterinarian because he knows little or nothing of the medical sciences.

There must be some common ground, some knowledge, interest or sympathy in common between the veterinarian and his client, and between the veterinarian and the public, before the veterinarian can establish confidence in his professional and scientific ability. Hence, while a thorough knowledge of the science and practice of veterinary medicine and close application to professional interests are essential to the prestige and influence of the profession, more will be done toward building up a confidence in and respect for the profession by the veterinarian of culture and character taking an active part in the social and the public activities of the community.

By a profound knowledge of the science and practice of veterinary medicine and by a close application to the practice of his profession a veterinarian may attain high standing among his professional colleagues and may obtain an extensive and lucrative practice, but he will do much less to establish in the public mind a high respect and confidence in the veterinary profession than the man who in addition to these necessary qualities possesses education and culture and freely participates in the public activities of his community.

For instance, men like Dalrymple and Cary in the South, although none will question their professional attainments, have done much more to advance the esteem and respect in which the profession is held, by their interest in, their knowledge of, and their helpful service for the development of the livestock interests of the South, than by their strictly professional activities.

In fact, I venture further, and with equal confidence, that the public estimate of the veterinary profession is not based chiefly on the professional service rendered by veterinarians. The evaluation of the veterinary profession by the general public is based chiefly on standards familiar to the general public. These standards are, of course, not veterinary, but the public's estimate of the profession is none the less likely to be fair and accurate.

Unless I can command the respect and confidence of my community by my knowledge of the things with which they are

familiar and by my interest in and service to the community activities in which they are interested, I can not inspire their confidence in my knowledge of veterinary medicine. And unless I can command their confidence in my honesty as a man I can not command their confidence in the honesty of my veterinary or professional service.

The veterinarian, the professional man or the specialist loses a potent influence for the advancement of his profession or specialty by the isolation in which he places himself. His technical language and conversation, his reluctance to give information in a language which the public can understand, his apparent effort to surround his work with a glamor of mystery, and his transparent fear of losing practice by imparting any of his sacred (?) knowledge, weaken his influence for the good of his profession, lessen his own influence for good in his community, and reduce the opportunities for great public service which he might render.

Recently I heard a veterinarian addressing a body of farmers on a subject of very great interest to them, but by the use of technical terms, in fact, by the use of a language which was absolutely foreign to his audience and which they could no more understand than if he had spoken in French. This veterinarian sacrificed the highest esteem of his audience, an opportunity to impart much useful information which would have resulted in tremendous good to his audience and been reflected back in his own greater usefulness, and also the higher esteem in which his profession would have been held.

I know of no one thing which more effectually holds the public at a distance and consequently lessens its respect and confidence in the professional man than his use of technical terms which it can not understand, in his private conversation, public utterances, and writings. For instance, I can not think of a whole sentence which would tell the man who knows more than the single word "periosteum"; but it tells the average person nothing, and he instinctively resents the use of such technical terms, whether or not he shows that resentment at the time.

Free, open frankness and ordinary common sense in discussing veterinary matters of interest to the individual client or the public, and the use of a language which is understood, will do more to increase the appreciation of the public for the services of the veterinary profession than any amount of the most

profound scientific wisdom couched in technical terms and shrouded in mystery by the use of what to the average man is an unknown tongue.

The veterinarian has reason for and sometimes complains of the kind and amount of publicity which his public services receive. To a large extent he has only himself and the habits, or shall I say traditions, of his profession to blame. It is not the so-called publicity which is put out that counts, but what is "put over." No matter how many columns may be published, unless the matter is such as the public will read, unless it is matter of public interest, unless it is put in a form which the public can understand and appreciate, it is not real publicity.

The veterinary profession owes it to itself and the public, whose influence, respect and confidence it should have, to do more writing, more speaking and more advertising; for no information it can give out, no increase in the public's knowledge of veterinary facts, will lessen its compensations, but will add immeasurably to its opportunities for a larger public service and greater personal remuneration.

My plea, therefore, is for a broader education or greater culture and a more thorough training in agriculture and in livestock husbandry.

The veterinarian will not obtain his greatest opportunities for service to the public and himself until he gives himself, as the basis for his technical and professional veterinary training, a thorough knowledge of the sciences underlying crop growing and animal husbandry. In other words, he must be more broadly educated than those he is to serve, at least to the extent of being familiar with their business and then adding his own specialty as professional training.

Only by a broader general culture which will enable him to render a better service in the social, political and other activities of good citizenship will he be able to meet the general public on ground where interests and sympathies are in common, and this is the only ground on which he can ever reach the general public. Only by a knowledge of livestock husbandry can he meet his clients on a common ground of interest and knowledge, and secure that respect and confidence which common interests and knowledge beget.

Rend asunder the shroud of mystery, in which ages have en-

veloped it; in its public utterances divest it of the technical language which has maintained it in isolation, and clothe it with a knowledge of and interest in matters of common interest, if you wish to exalt the veterinary profession to that high plane of public service of which it is capable.

The public does not and can not know the veterinary profession and its tremendous services to present-day civilization, because you will not let them. They can not come to your special field, and you have either refused to go or could not go to theirs, because of a lack of education, or a lack of an inclination and desire to do so.

ENGLISH RESEARCH ON RICKETS

Announcement has been received of highly important discoveries by the Medical Research Committee of England during an extensive study of rickets.

The report of the committee, based largely on the work of Dr. E. Mellanby, emphasizes that rickets is not due to a single cause but to a combination of unfavorable conditions as to food and surroundings.

Dr. Mellanby found as a result of feeding experiments with more than 200 puppies, that the following factors tend to prevent rickets: (1) plenty of calcium and phosphorus in the diet, (2) the anti-rachitic vitimin (found most abundantly in cod-liver oil), (3) meat, and (4) exercise. A lack of these factors, and an excess of bread or other cereal food or carbohydrates, were found to produce rickets. The presumption is, naturally, that these same factors are important in relation to human nutrition.

The The anti-rachitic vitamin was found to be much more effective if the diet contained the necessary amount of meat, and of calcium and phosphorus; and if exercise was allowed.

It is Mellanby's idea that an important factor in the effect of meat to prevent rickets is its well known and characteristic stimulating action, which increases the effectiveness of the vitamins present.

Dr. Alfred F. Hess, of New York, has shown that exposure to sunlight also is very effective as a curative measure in the treatment of this disease.

CLINICAL OBSERVATIONS ON CATARRHAL MASTITIS IN THE COW[1]

By Louis A. Klein

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THREE TYPES of mastitis may be observed in the cow: (1) Parenchymatous mastitis, which affects the glandular structure of the udder; (2) catarrhal mastitis, which involves primarily the mucous membrane of the large milk canals, milk cistern and teat canal, and (3) interstitial mastitis, which is an inflammation of the connective tissue situated between and around the glandular structures and the excretory channels. Every case of mastitis, however, can not be placed within one or the other of these divisions. Inflammation beginning in the parenchyma may extend downward to the milk canals, milk cistern or teat canal; catarrhal mastitis may invade the parenchyma; and either of these forms may involve the interstitial connective tissue secondarily, while primary interstitial mastitis may break into the parenchyma. Nevertheless, a knowledge of the characteristics of each of the three types is essential in diagnosis, prognosis and treatment.

Catarrhal mastitis occurs more frequently than either of the other forms in herds maintained under a system of intensive milk production. This frequency of incidence together with a tendency to run a subacute or chronic course and to terminate in atrophy and loss of function of the affected quarter makes the disease of considerable economic importance. Many good dairy cows have been sent to the butcher because catarrhal mastitis has rendered them unsuitable for milk production, and a large proportion of the three-teated cows in our dairy herds owe their present condition to this disease.

The successful treatment of catarrhal mastitis depends very largely upon its early recognition and the prompt application of suitable curative measures, but as the first symptoms are usually slight and insignificant the prompt discovery of each case as it appears can be assured only by keeping the herd under close supervision. The disease may occur at any time

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

during the lactation period, consequently the supervision of cows in milk must be continuous.

SYMPTOMS, COURSE AND PATHOLOGY

In two-thirds of the cases of catarrhal mastitis there is no swelling of the udder apparent at the beginning of the disease, and the other third shows only slight swelling, with little heat and not much pain. Generally only one-quarter of the udder is affected.

On of the first symptoms observed is the presence of small white flakes in the first few streams of milk from the affected quarter. These flakes are often quite small, frequently no larger than a pin head, and may not be very numerous. Unless the milk is drawn into the palm of the hand or on a finely meshed wire strainer and closely examined, they will not be noticed. In ordinary milking they are almost certain to escape detection. Milk from a quarter which is not diseased may show a flake or two now and then, but this does not happen often and does not occur at successive milkings.

Another early symptom is difficulty in expressing the first stream or two of milk. It is usually stated that the cow "milks hard," although formerly an "easy" or ordinary "milker." Sometimes it is reported that the cow kicks when milking is begun, whereas formerly it submitted quietly to the process. These symptoms are due to obstruction of the teat canal resulting from swelling of the mucous membrane or collection of exudate. The stream of milk expressed from the teat may be split or deflected from the normal direction when particles of exudate collect and dry around the outlet of the teat canal. If the end of the teat is examined in such cases before milk is expressed, small yellow crusts will be seen around the orifice of the teat canal. Sometimes, however, dried crusts of milk collect at the same point and change the direction of the stream in a similar manner when no disease is present, probably because of fatigue of the sphincter between the lower end of the milk cistern and the upper end of the teat canal. Splitting or deflection of the first few streams of milk, in the absence of any other changes, is therefore not necessarily an indication of the presence of catarrhal mastitis. Another of the early symptoms is that the stream of milk is not cut off completely when pressure is removed from the teat, with the result that

the end of the teat is smeared with milk. This is caused by the mucous membrane being swollen and interfering with the closing of the sphincter. In the early stages of the disease, a drop of mucus or pus may be squeezed out of the teat canal by pressure on the end of the teat.

While catarrhal mastitis is primarily an inflammation of the mucous membrane of the large milk canals, milk cistern, and teat canal, the inflammation, if not checked, extends into the submucous connective tissue, producing proliferative changes. In this way the mucous membrane of the milk cistern becomes thickened and may then be felt as a hard cord about as thick as a lead pencil running through the middle of the teat when the teat is rolled between the thumb and fingers. Flat disc-shaped thickenings and nodular indurations may be felt in the upper limits of the milk cistern around the terminations of the large milk canals. Growths appear upon the wall of the milk cistern and teat canal as a result of hyperplasia of the epithelium and may be detected by palpation. These often interfere with the withdrawal of the milk. This particular condition is known in some dairy sections as "spider in the teat." The proliferative process, when once started in the submucous connective tissue, may extend upward into the interstitial connective tissue of the glandular part of the udder, producing indurated areas of greater or less extent, and the newly formed connective tissue, subsequently contracting, causes atrophy of the gland cells with permanent loss of function in the area affected. The entire quarter may be involved, in which case the cow becomes a three-teater.

Catarrhal mastitis does not affect the secreting cells of the udder, and therefore the milk does not show any marked changes, at least not in the first stages of the disease. It has been mentioned that the appearance of small white flakes in the milk is one of the first indications of catarrhal mastitis. These flakes are usually present in the first few streams from the teat of the affected quarter, but sometimes they appear in the middle or at the end of the milking. But to the casual observer, the secretion at this time has the general appearance of normal milk and throughout the entire course of mild cases may not show any marked change. As the disease progresses, however, the careful observer will detect clumps of mucus or pus, usually in the first few streams of milk, or the first expression may con-

sist entirely of pus followed by milk of normal appearance. The first few streams from the teat may gradually assume more and more the appearance of pus, but the secretion subsequently drawn from the udder will have the appearance of normal milk unless the disease extends upward into the secreting structures, and then a turbid fluid resembling whey, or a fluid resembling serum, containing clots of fibrin and clumps of pus, will be obtained from the affected quarter. In cases of severe mucous catarrh the secretion from the affected quarter becomes gradually more and more slimy and viscid and takes on a grayish tint. By carefully observing the changes in the secretion the extent and character of the disease may be judged, and these changes are also of assistance in making a prognosis. When the whey-like or serum-like fluid is present or the secretion contains much pus, the prognosis is unfavorable.

ETIOLOGY

Streptococci are nearly always found in the secretion from a quarter affected with catarrhal mastitis. Staphylococci are present sometimes, streptococci being absent, but in most cases streptococci are present. F. S. Jones (1)[1] has isolated both hemolytic and nonhemolytic streptococci from cases of mastitis. The hemolytic streptococci could be classified in two groups on the basis of their action on carbohydrates, 19 strains in one group and 10 in the other, but all strains except 3 were agglutinated by antiserum from a rabbit immunized with a single strain. On the same basis the nonhemolytic streptococci could also be divided into two groups, one containing 34 and the other 5 strains, while all the strains were agglutinated with an antiserum prepared from one typical strain.

On rare occasions the disease spreads rapidly through a herd, attacking one cow after another. This has occurred when the cows were in good physical condition, properly fed, and kept under good sanitary conditions, the infectious character in such instances being due apparently to a highly virulent strain of streptococci. But ordinarily, cases of the disease appear in a herd at irregular intervals, one case at a time or sometimes several at about the same time, cows standing in different parts of the stable and often those milked by different milkers being attacked.

[1] Figures in parentheses following authors' names refer to list of literature at end of paper.

Considering the opportunity for bacteria to be transferred from the udder of one cow to that of others by the hands of the milker, the manner in which cases of this disease ordinarily appear in a herd justifies the conclusion that other factors are concerned in addition to bacteria. On one occasion the appearance of an unusual number of cases of catarrhal mastitis in a large dairy herd was found to be due entirely to washing the udders with water and permitting them to be exposed in a wet condition to a wintry atmosphere (2). The water flowed down the surface of the udder and collected at the point where the teat and udder join, dropping thence to the ground. The skin at this point was found to be inflamed, swollen, and in many cases cracked. As the skin is here separated from the mucous membrane of the milk cistern by only the subcutaneous and submucous tissue, the inflammation in the skin could readily extend to the mucous membrane. No streptococci or staphylococci were present in the milk from the affected quarters, and when the plan was adopted of wiping the udder dry after washing no new cases appeared, while all the affected cows recovered except several of those first affected in which induration had begun, and these were sold for slaughter. There is no information as to what extent, if any, catarrhal mastitis is associated with the ordinary chapped and cracked teats which are more or less common in cold weather. The udder may be subjected to the effects of cold in other ways, as when the cow is compelled to lie upon a cement floor without sufficient bedding or is exposed to cold drafts.

In a number of instances which have come under observation the circumstances have pointed to overfeeding as a factor in causing catarrhal mastitis. In one herd a number of cows began to give milk containing flakes and the feces of some of them were quite soft. On inquiry it was learned that the ensilage had been used up about ten days before and then the feeding of new hay, put up about three weeks earlier, was begun. As the cows seemed to like the hay and gave more milk, the quantity fed was gradually increased until a number were scouring. About this time the "flaky" milk began to appear and some of the other early symptoms of catarrhal mastitis were present. The hay ration was changed to two parts of old hay and one part of the new, and new cases soon ceased to appear, while those already existing recovered and the feces of the cows which

were scouring became normal. On several occasions the appearance of a number of cases of catarrhal mastitis has been observed in a herd following a general increase in the amount of concentrates being fed. In one instance milk from the affected cows was examined but neither streptococci nor staphylococci were present. Certain cows have been under observation which developed catarrhal mastitis whenever their grain ration was increased beyond a certain limit.

These observations have led me to conclude that overfeeding and the effects of cold on the udder, but especially the former, play a very pronounced part in causing catarrhal mastitis, and that, while the bacteriology of the disease is important, these factors which appear to operate usually as accessory causes but which may cause the disease when operating independently must receive due consideration when treatment is prescribed.

Several cases have been observed in which one quarter was slightly swollen and firmer than normal but not hot or painful, while flakes and sometimes clumps of mucus were present in the milk from the affected quarter, and the herdsman has expressed the opinion that the quarter was not milked out thoroughly at the previous milking. The milker has denied the charge and it has not been possible to arrive at the facts. Hot water bathing followed by massage usually restores these cases to normal in 12 or 24 hours. Incomplete milking and delayed milking are believed to favor the development of catarrhal mastitis by those who have had extensive clinical experience with the disease, and the practice of delaying or omitting milking in order to "bag up" a cow which is to be exhibited or offered for sale is generally considered harmful.

TREATMENT

In general practice the treatment of catarrhal mastitis often fails to give satisfactory results. One of the principal reasons is that the veterinarian is not given an opportunity to apply treatment until the disease has made considerable progress. The best results can be obtained only when treatment is begun early and is based on proper consideration of all the etiological factors. But, unfortunately, the early symptoms are very slight or insignificant and under ordinary conditions most cases are likely to be overlooked until they have been under way several days. The first requirement, therefore, is some arrangement

which will place all milking cows in the herd under close observation for the initial symptoms. The treatment must be planned for the herd rather than for the individual cow. In herds operating under milk regulations requiring the fore-milk to be drawn into a special vessel and discarded, this close supervision is easily arranged for. It is only necessary to have the vessel in which the fore-milk is drawn covered with a finely meshed wire strainer and to instruct the man who draws the fore-milk to watch carefully for flakes or clumps and to report any cow immediately when flakes or clumps appear on the strainer, or when there is difficulty in drawing the milk, or when any of the other early symptoms of catarrhal mastitis are observed. At the same time such provision as is possible should be made to guard against overfeeding, exposure of the udder to cold, and careless milking. Overfeeding is avoided with greater difficulty than the other conditions because the herdsman is naturally ambitious to obtain a high production.

Upon the appearance of the first symptom of catarrhal mastitis the grain ration should be immediately withdrawn and the feeding of ensilage or any other succulent material stopped, the cow being fed only hay; timothy is better than clover or alfalfa. At the same time the cow should receive a full cathartic dose of Epsom salts to deplete the inflamed area, and this should be followed by a diuretic to keep up the depleting effect. Salicylate of soda is a good diuretic for this purpose, as it is eliminated in part in the milk in the form of salicylic acid, which exerts an antiseptic effect upon the interior of the udder. Several years ago, in a paper (3) read before this Association, I recommended the administration of hexamethylenamina, a formaldehyde preparation, in solution by the mouth for the purpose of disinfecting the udder, and subsequently Frost (4) suggested the use of formaldehyde solution or formalin. Desiring to increase the disinfectant action on the udder, and believing that the quantity of formaldehyde eliminated through the udder could not be increased very much by increasing the dose, I have endeavored to obtain a more powerful disinfectant action by administering salicylate of soda and boric acid in addition to the formaldehyde, boric acid also being partly eliminated through the udder. A half-ounce of sodium salicylate and 2 drams of boric acid [1] are given in solution in a quart of water

[1] These two drugs should be kept separate until they are dissolved in the water. If mixed together in the dry state they "cake" and form a more or less solid mass.

morning and night, and in the middle of the day a half ounce of formaldehyde solution in a quart of water is administered.

From the beginning the affected quarter should be milked out at short intervals—every hour or two if possible. This is an important part of the treatment. A portion of any antibodies which may be found in the blood will pass over into the milk, and these, together with the antiseptics eliminated in the milk, will exert an inhibitory or destructive action on bacteria present in the udder, while the passage of the milk through the milk channels will wash the exudate from the diseased mucous membrane and carry out bacteria and their products. All of the beneficial effects which may be derived from the injection of antiseptic solutions into the udder may be obtained by frequent milking without the irritant effects which such solutions have upon the tissues and without danger of infected material being carried up into the unaffected parts of the udder by the injection.

To obtain the best results this method of treatment should be made a part of the routine management of the herd and the veterinarian should supply the drugs in such form and with such directions as will insure their proper use in his absence. No cow should be put back into the milk line and placed on full feed, however, until the veterinarian has had an opportunity to examine the udder and to assure himself that resolution has occurred.

If induration appears, the affected part should be painted with a mixture of 2 parts of tincture of iodin and 5 parts of oil of turpentine two or three times a day until the skin becomes tender. This same treatment is also indicated when the catarrhal condition exhibits a tendency to persist. No local treatment is applied in the early stages of the disease unless the affected quarter is swollen, and then it is bathed in hot water for 20 to 30 minutes, rubbed dry and massaged with an ointment containing camphor, iodin or salicylic acid. This treatment is applied twice daily until the swelling subsides and the udder regains its normal consistency.

At the time of writing, 44 cases of catarrhal mastitis have been treated under the system described. Of these, 36, or over 81 per cent, recovered, one-half of them by the fourth day and all but two by the seventh day. One of these two recovered on the tenth and the other on the twelfth day. The other 8

cows included in the total number treated were sold for slaughter. One was under treatment for 16 days and one for 17 days, and these were sold because the disease of the udder was considered incurable, but of the other 6 cases 1 went to the butcher on the second day after being discovered and placed under treatment, 2 on the third day, 2 on the fourth day, and 1 on the fifth day. These 6 cows were sold because of age, poor productivity, or for some reason other than the disease in the udder.

After recovery has occurred the cow should be kept on the hay ration for at least two days and then should receive not over 2 pounds of grain a day for the first week, and after that a gradually increased quantity until on full feed. If the cow is put back into the milk line and fed to force milk production too soon the disease will recur.

I fully realize that the practitioner is called on to treat catarrhal mastitis under conditions which make the adoption of this system difficult or impossible, but the principles upon which it is based apply with equal force to the treatment of all cases of this disease, and they should therefore be given all the consideration that circumstances will permit. There are many dairy herds, however, in which the system can be introduced without any considerable change in the routine management.

The infectious type of catarrhal mastitis calls for a different method of treatment.

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Prof. Charles Laveran, a leading French scientist, has died at the age of 77. He did notable work on microparasites and on diseases transmitted by insects. He was a member of the Academy of Sciences and the Academy of Medicine and associate director of the Pasteur Institute. In 1907 he received the Nobel prize in medicine.

THE ACRIFLAVINE AND PROFLAVINE PREPARATIONS IN BOVINE PRACTICE [1]

By E. J. Frick

Manhattan, Kansas

PREVIOUS TO THE WAR the flavine products were made only in Germany and their value as antiseptics was but little known. During the war they were made by British chemists and their solutions were much used in wound treatment.

Acriflavine is diaminomethylacridine. Proflavine is diaminoacridine sulphate. There are many other compounds of the yellow dye group such as agroflavine, trypaflavine, etc., that are coming into general use. In human medicine acriflavine today is almost completely replacing the argyrol and protargol treatment in gonorrhea.

The use of acriflavine and proflavine in bovine practice at the Kansas State Agricultural College clinic has extended over two years. The solution that apparently gave best results and was the most often used consisted of 1 gram of acriflavine and 5 grams of proflavine to 1 gallon of normal saline solution. This is about 1 to 4,000 of acriflavine and 1 to 800 of proflavine solution. It should be kept in amber-colored bottles, as strong light tends to decompose it. For intravenous use fresh warmed solutions should be used. To remove the stains on the hands wash with 1 per cent bichlorid soap.

The flavines are antiseptic, not disinfectant, in action. Inhibition of bacterial activity is the marked property of these compounds. The high bacteriostatic power and low toxicity to living tissues of the flavines is of great value in the successful treatment of local infections.

There is complete absence of evidence of damage to tissues where the acriflavine and proflavine salts are used in solution not stronger than 1 to 1,000. They are not neutralized by admixture with body fluids such as serum, urine, etc., therefore they do not require frequent renewal. They possess a high diffusibility and will penetrate through the submucosa of the urethra and bladder. They are relatively nontoxic and nonirritating.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

Regarding the clinical use of the flavine solution on bovines, we have had very good results in the treatment of vaginitis, cervicitis, metritis and retained placenta, thoroughly washing out the horns and body of the uterus, using the return flow irrigation method with a solution of one ounce of our flavine solution to a gallon of clean normal saline water. Where infection is severe a stronger solution can be used without danger of irritation. In conditions of septicemia such as metastatic pneumonia following metritis, etc., intravenous injections of the stock flavine solution are administered. The dosage will be dependent on the condition. Thirty cubic centimeters every two hours for two days showed marked beneficial results in our hands. Local injection of infected quarters in cases of purulent mastitis, with the regular flavine solution, together with the internal administration of one ounce of formalin per os have given prompt recoveries. Puncture wounds of the udder responded well. As a wound dressing, wet flavine packs have given excellent results in recent wounds. There is an absence of toxicity in large wounds, prevention of suppuration and spreading of sepsis, and the primary dressing need not be changed for two or three days, and then is easily and painlessly removed. The yellow staining property is proof of its penetrating power and has its effect on the owner.

In long-standing, stagnating wounds and in infections caused by *Bacillus necrophorus* we have found iodin and potassium permanganate solutions to be more effective than the flavines. For washing out wound cavities, open joints, etc., one ounce of flavine solution to a quart of normal saline has worked admirably.

When administered by mouth or intravenously, acriflavine and proflavine appear in the urine in less than one hour and continue for 24 hours. We have not had an opportunity to test their value clinically in purulent nephritis or cystitis, but favorable case reports in human medicine are not lacking.

In Belgium an acriflavine paste prepared by mixing 0.1 per cent of acriflavine with sodium stearate is commonly used. Also a gelatin or starch mucilage containing 0.1 per cent of acriflavine is extensively used.

The flavines seem to have a selective action against the cocci group of organisms, as best results are obtained when treating that type of infection. Subcutaneous or intramascular in-

jections of dilute proflavine and acriflavine 1:1,000 solutions may be given in conditions where indicated. The flavines are not expensive when properly used, as a gallon of the combined 1 to 5 mixture costs about $1.80 and will go a long way. It leaves no disagreeable odor on the hands, and the stain is easily removed by means of bichlorid soap or solution.

In conclusion we wish to state that we have found solutions of acriflavine and proflavine to be decidedly beneficial in recent wound treatment in uterine and other body cavity infections and when used intravenously in conditions of septicemia, pyemia, pneumonia, etc. These preparations, like some few new friends, wear well and improve on further acquaintance.

LIVESTOCK DEVELOPMENT IN CENTRAL AFRICA

A recent report on government agricultural operations in the eastern province of the Belgian Congo, in the heart of Africa, shows that veterinary science is playing an important part in the development of a region that was first made known to the outside world by Stanley's explorations less than thirty-five years ago.

Good pasturage affords a favorable condition for stock raising, but livestock are not numerous. The Belgians are introducing good breeding animals and are taking steps to breed up the native stock by crossing. Dipping tanks are being installed. Bovine "sleeping sickness" (nagana?) and a disease known locally as "bitaka" are reported. Rinderpest has been excluded.

Buttermaking and cheesemaking are being developed, and churns are being introduced, as the native products "do not present guaranties of necessary cleanliness." Goats are numerous in some districts. Orpington chickens have been introduced and are doing well.

It is interesting to note that the Belgian Government is carrying out its promises to the natives by turning over to them breeding animals in payment for their aid in furnishing food and porters for the Belgian African forces during the war.

In the more fully developed region to the west the Belgians have a veterinary research laboratory. Among other work, investigations in vaccination against rinderpest are being carried on. This disease causes a mortality of 80 to 90 per cent in the native cattle which it attacks.

THE HANDLING OF THE FISTULA OF THE WITHERS IN PRACTICE [1]

By B. W. Conrad
Sabetha, Kansas

IN ALL VOCATIONS there are unpleasant phases of usefulness. Human tendencies are to criticize and lay stress on disappointments. Veterinarians fail to perform the necessary surgical interference to make recovery possible in cases of fistula of the withers. Hoping to assist brother practitioners in their field of endeavor, I offer the result of seventeen years of experience in country practice, covering many cases of this disease.

The cause of fistula is immaterial. The fact that it exists is all sufficient. The essential thing for our profession is its cure, and as promptly as possible. The history, nature of swelling and location are of importance as showing the treatment necessary and in giving prognosis. Many cases are made incurable by the treatment of owners and empirics. Blistering seldom repairs the condition and must be approached with caution. Structures involved are too deep-seated to gain relief by external medication. My experience in the use of caustics has been disappointing. For twelve years I have followed surgical interference, and the longer I practice it the more convincing is its efficiency. The use of the Williams operation for poll evil and fistula has been followed for years. For the poll evil, it is good, but for the fistula I modify the operation and avoid the long incision on the crest of the withers, thus doing away with the possible large gaping wound and the unsightly conditions that my clientele resents. True, my treatment is more difficult and requires a more careful procedure, but its advantages warrant its continued use.

Manner of restraint is by twitch, local anesthesia, complete anesthesia and casting harness. Complete anesthesia is the ideal condition, but local conditions often make it impossible. Any other condition is courting censure from the humane society and lovers of animals. The instruments needed are clipping shears, scalpel, retractors, blunt-pointed bistoury, artery forceps, dressing forceps, curette, bone saw and bone forceps.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

The affected part in the adjoining area is clipped and painted with tincture of iodin. Be sure that the iodin covers not only the field of operation but also that area liable to give added infection during the operation. I take double precaution by washing the area above described with antiseptic solution, then let it dry. Another application of iodin is then applied. With the scalpel I make two incisions on each side, one anteriorly, one posteriorly, to enlargement. The anterior one is made obliquely downward and forward. The posterior one is made downward and backward. With the retractor lift the skin from each opening, and by use of the scalpel separate the skin from the enlarged area. Through the four openings dissect out the ligament and all necrotic tissues. In case the part to be removed is larger than the opening, divide the tissue into sections and thus remove it. Examine the spinous processes carefully; if injured, curette; if broken, remove with bone saw or bone cutters. Curette the whole cavity. With dressing forceps and pledgets of cotton remove all remaining tissues. Apply tincture of iodin to inside of cavity. Pack cavity with iodiform gauze. Remove in twenty-four to forty-eight hours. Then apply zinc oxid ointment or 00 capsules filled with iodiform every two or three days.

The great enemies of fistula are, first, the old-time quack with his bluestone, corrosive sublimate, butter of antimony, and caustics. Next is the officious neighbor advising some form of aqueous solution to irrigate the wound. Last, but not least, is the pharmaceutical house with its sure cure of fistula for two dollars.

The added use of bacterin in many cases assists the healing process, but all necrotic tissue once removed, very little after treatment is needed.

The National Veterinary Medical Association of Great Britain and Ireland held its fortieth annual general meeting at Bath, a noted English watering place, August 1 to 4.

A British veterinarian, according to *The Veterinary Record,* has executed an unusual commission in killing in a humane manner 27 cats belonging to an octogenarian spinster. The old woman's pets had overrun her establishment, and a relative ordered a wholesale clearance.

DISPENSING AS AN ASSET TO THE VETERINARY PRACTITIONER [1]

By CHARLES W. BOWER
Topeka, Kansas

IN PREPARING THIS PAPER it was not the writer's attitude to create any antagonistic feeling among our coworkers and friends the druggists. They have vast fields in which to work, and we are proud when we have several good pharmacists in our city with whom we can cooperate.

In selecting this subject I have in mind six main topics that I wish to bring out and upon them express due emphasis.

1. Dispensing as an asset (*a*) to veterinary practitioner, (*b*) to the clientele.
2. Accuracy.
3. Brings business back to you.
4. Purely professional.
5. A unique system in practice.

If a proper system of dispensing is followed it will be readily noted that the drugs dispensed will mean a great asset every month. From records of the writer's practice it will be found that in a month's business that has a gross income of $800 there will be from $150 to $200 of dispensing. This is not at all out of the ordinary, and it may be had in any practice if only a little time and care are given to this branch of our profession.

Another asset to the practitioner from dispensing is business that you would not get if it were not that your client wants a certain medicine. It happens many times that a person will come for a certain drug or combination of drugs to treat a case that he has diagnosed himself and doubtless correctly, too. He could just as easily go to the drug store, where he would purchase some patent concoction, but he knows that you will dispense, and thus he will give the business to the one to whom it rightfully belongs.

As an asset to the clientele I find that I can save my clients at least 66 2/3 per cent on their prescriptions and then make a very desirable profit myself. As another asset to the public, let

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

us take the man that came to you instead of going to the drug store. In this case let us imagine that he did not make a correct diagnosis. When he comes to you and asks for a certain medicine and tells you what he wants it for, you have the opportunity to prescribe and dispense for his exact needs and thus avoid the expense of his experimenting and injuring his animals.

As a second general topic, let us consider accuracy. Do not misunderstand me. I do not wish to imply that we as practitioners are much more accurate than a pharmacist, but it has come to pass many times in my practice and in yours that a pharmacist would get a certain prescription and if he didn't happen to have just exactly what was called for he would do a little substituting, and then if we didn't get the desired results our clients would blame us and we would not know why. If there is any substituting to be done the practitioner should be the one to do it.

We are trained in our various veterinary colleges to compound formulæ and to dispense in a professional way, and it is no more than right for us to exercise this training. Furthermore, it keeps our minds keen on materia medica, and causes us to look up and study medicine and materia medica more than we ever did in college.

In conclusion of this paper the writer wishes to bring before this group of practitioners a system that has been worked out in his practice. A great deal of dispensing is done, but a prescription is written for all medicine dispensed. The prescription is written just the same as if it were going to the druggist, but instead it is numbered and the corresponding number is placed on the label and the prescription is filed for further use and reference.

At first thought you will probably think that this is a lot of needless work and expense. In fact, perhaps many of you are telling yourselves that "I dispense as much or more medicine than that fellow, and I don't keep such a record either." That is doubtless true, but you should consider that with this system you not only have a complete record for refilling, which may be done absolutely accurately, but you also have a record of your good prescriptions that really hit the point. You also have the price you charged your client, so that there will be no dispute when a refill is made; and furthermore it will aid you to render better service. For example, suppose a client

would come into your office a year or two from the time he had a certain prescription filled and say to you: "Doctor, I want some of that medicine you gave me for my horse some time ago." It would take a good memory for a busy practitioner to remember what the man wanted. Whereas with the number on the old container the prescription may be readily found and refilled in proper and professional manner and accuracy. A neat label and a suitable container should be provided and the package should be neatly wrappped.

When your clients see you dispense and keep your record in such a manner they will doubtless ask many questions, but they will believe in you because they will readily see that you are putting in some extra effort really to help them and that you are making professionalism and accuracy paramount.

The appointment of Dr. Ernest B. Forbes, of Chicago, as director of the Institute of Animal Nutrition at Pennsylvania State College, was announced by President Thomas. He will assume charge of the institute at once.

Dr. Forbes received degrees in science and agriculture from the University of Illinois in 1897 and 1902 and the doctorate degree from the University of Missouri in 1908. At one time he was acting entomologist for the State of Minnesota and taught entomology and animal husbandry in the Universities of Illinois and Missouri before undertaking nutrition work at the Ohio experiment station. He is a member of the National Research Council, the American Chemical Society and other similar organizations, and his specialty is work with mineral elements in animal nutrition.

In Memphis, Tennessee, on July 28, a number of enthusiastic veterinarians from Arkansas, Kentucky, Mississippi, Missouri and Tennessee took steps toward organizing a new association to be known as the "Dixie Veterinary Medical Association" with a permanent home in Memphis. Officers were elected and a committee appointed to draft a constitution and by-laws with the understanding the first meeting to be held some time in October, 1923.

SOME OBSERVATIONS OF PRACTICAL INTEREST [1]

By M. JACOB

University of Tennessee, Knoxville, Tenn.

IF ONE were to attempt a review of experiences extending over a period of more than twenty years, giving due consideration to those things having both useful and practical bearing, it would occupy more time and space than one could reasonably expect on an occasion of this kind. However, if one is so inclined with his work, it is easily possible to present at least a few observations that may be of interest to those engaged in a similar vocation. The important problems confronting the veterinarian in one section of the country may be of lesser importance in another. As a matter of fact, they vary from an all-important to a negligible factor regarding their influence toward successful animal husbandry. This no doubt has in a measure been responsible for a difference in viewpoint regarding many important problems involving the activities of the veterinary profession. This is true also of many other lines of endeavor and should not be interpreted as lacking in professional efficiency. It is perfectly natural that one should become more conversant with problems that with him are more or less continual than those he has to deal with only now and then. However, as time goes on, every problem is becoming more universal, this through the influence of our modern system of education and a desire on the part of the veterinarian to familiarize himself beyond the confines of his immediate work. Then again, our commercial activities are such that a problem which is vital in one State, county or section today may be equally so in an entirely different one tomorrow. This is applicable especially to the livestock industry and therefore of interest to the veterinarian. With these few basic thoughts in mind, it is my purpose to review a few observations which I trust may be of some interest.

POWDERY MILDEW OF RED CLOVER

During the early part of last May we began receiving letters of inquiry at the University of Tennessee regarding a pecu-

[1] Presented at the semi-annual meeting of the Virginia Veterinary Medical Association, Blacksburg, Va., July 13, 1922.

liar clover disease appearing in some sections of the State. As time went on these inquiries became more numerous, and by the latter part of May we were receiving enormous numbers of inquiries by every means of communication, seeking information regarding this new clover disease and especially as to whether or not it was harmful to livestock. In the meantime, however, it had become prevalent on each one of our Experiment Station farms, and, as in every other section, was confined entirely to red clover. When submitted to our plant pathologist he identified the mildew as *Erysiphe polgoni*, which had occurred the previous year in some of the Eastern States, but further than that could give little or no information about it. Our Federal authorities could add nothing more other than that in Europe, where it has previously been seen, veterinarians had reported the occurrence of inflammatory conditions affecting the mucous membrane of the mouth, throat and stomach when red clover affected with this disease was fed to livestock.

In order to give our farmers dependable information regarding the advisability of feeding this mildewed clover, a preliminary feeding and grazing experiment was undertaken. This was considered very urgent, as many were reluctant in cutting their red clover for hay, and if it were not so used an enormous loss in feeding material for this year would have been entailed. Fortunately we had one field of about ten acres on the Station farm at Knoxville sown almost entirely to red clover and which was admirably adapted to conduct the experiment, which was started May 31. The field at this time had the appearance as though limestone dust or ashes had been broadcasted, which gives an idea as to the prevalence and extent of the mildew. A part of the field was inclosed, on which we placed four hogs and four sheep. They grazed on this area without anything else except water for a period of 14 days. From the other part of the field the clover was cut and cured for hay in the usual manner. This was fed to four Percheron colts, from one to two years old, and four Holstein heifers, each receiving only a small amount of grain. The hay was fed in quantities of about as much as they would consume, extending over a period of 14 days for the heifers and 35 days for the colts. During the entire period the animals were under close observation, and they gave no evidence that the clover so affected was un-

palatable and, as a matter of fact, seemed to consume it with the usual relish. At the close of the experiment the interior of the mouth of each animal was closely examined, but no evidence of any irritation could be detected. Furthermore, they all came out of the feeding and grazing experiment without any ill effect whatsoever. Our conclusion, therefore, was that powdery mildew of red clover (*Erysiphe polygoni*) is harmless to livestock.

However, in giving these results to the farmers and veterinarians of the State, we drew attention to the fact that the spread of this red clover disease could be partly accounted for by the unusual amount of rain during the spring and early summer, with the result that it was a very difficult matter on many farms to cure the hay properly before it was stored or stacked. We therefore may expect to see more or less forage poisoning if moldy hay of this kind is fed promiscuously, especially to horses and mules, which might incorrectly be attributed to the powdery mildew disease, which of itself has been found to be harmless.

EPIZOOTIC OF CANINE PSEUDO-EPILEPSY

During the early part of the past winter I received a few letters from the western section of the State asking for advice regarding a peculiar disease occurring in a dog which the owner always described as "fits." At that time I attributed the condition either to a complication of distemper or to some digestive disturbances brought on by the presence of intestinal parasites. But before long I began to realize that a condition existed which was entirely new to me and which differed very decidedly from the usual line of nervous disturbances in dogs with which we are all more or less familiar. By the beginning of April it had become so widepsread that the laity had already determined upon its nomenclature and referred to it as "fright disease," "running disease," "fit disease" or "running fits," based, of course, upon the most pronounced symptoms. Since then I have had an opportunity to observe a great many of these cases and have endeavored to draw some conclusions based upon clinical characteristics. I have made a careful search of available veterinary literature, but as yet have been unable to find anything which in its description bears any resemblance to this disease unless it is tetania or tetanus inter-

mittens, referred to but very briefly by Hutyra and Marek. So far as I have been able to learn, it has made its appearance in practically all of the Southeastern States. Whether it has occurred in other sections of the country I am not at this time prepared to say.

As in true epilepsy, the onset is very sudden, with no apparent premonitory symptoms. The dog goes into a state of extreme excitement, and unless confined will run and howl as if terribly frightened. At times the attack is more typical of the ordinary convulsion, although a complete loss of consciousness is not characteristic, in which respect it differs from true epilepsy. The attacks are usually of short duration, lasting as a rule for only a few minutes, following which the dog again assumes its normal composure. In the majority of cases there is a recurrence of the attacks within a few hours, days or weeks. I personally know of cases that have developed these paroxysms at varying intervals for a period of more than two months. Then again, I know of others that had only one attack and suffered no further inconvenience. In a few cases, following repeated attacks, the dog manifested considerable depression. During the periods of excitement there is frequently noticed involuntary movement of the bowels and kidneys. There is no change in temperature other than a slight elevation during or immediately following the attacks. It affects dogs of any age or breed. The history of these cases does not indicate an association or complication with any other disease, the owner invariably stating that the dog appeared absolutely normal previous to the attack.

In a few cases upon which a postmortem was held there were no visible lesions other than a hyperemic condition of cranial meninges, varying somewhat in intensity. The mortality from this disease is comparatively low, although a large number of dogs so affected have been destroyed, on account of the faulty impression that it was a form of rabies. I have heard of communities where the dog population has been practically wiped out, the people having become panic stricken when a few of these cases occurred, which resulted in destroying not only the affected dogs but the exposed or others of the community as well. Then again in some instances the owner or attendant has been bitten while trying to control the dog during these violent

attacks. This was due, however, to the fact that the dog was biting for freedom instead of with malicious intent. Nevertheless, as is usually the case under conditions of that kind, the guilty dog as well as others in the neighborhood must submit to destruction.

The treatment as carried out by myself has been relatively simple, consisting of a hypodermic of apormorphia in one-tenth to one-eighth grain doses administered during or immediately following an attack, and in one or two hours later give a large dose of castor oil, the latter to be repeated in four or five days. In addition the dog should be fed very lightly for at least two weeks and should be confined in the meantime. Following the initial dose of apormorphia, nerve sedatives in the form of bromides may also be indicated. This line of treatment has given satisfactory results.

Now the question comes up, what are we dealing with? As previously stated, until the beginning of the present epizootic this disease, in its present form at least, was entirely new to me, and the fact that no dependable reference could be found in any veterinary treatise is further evidence that it is new or has passed unobserved by the profession.

Although having no laboratory proof, I am of the impression that it is an infectious disease with the probable localization of the organisms in the region of the central nervous system and manifesting itself by the psychic disturbances already referred to. It would be difficult to conceive of a disease becoming so widespread in such a short period of time, presenting such well-defined symptoms, unless there existed a specific etiological factor. There may, of course, be certain secondary conditions essential for its occurrence, which, to me, however, have not become apparent. From the fact that dogs in the pink of physical condition seem especially susceptible, the disease bears considerable resemblance to many other infectious diseases with which we have to deal. The future no doubt has in store for us considerable interesting information regarding this disease. In the meantime, however, we might at least adopt a name suitable to the condition. I would suggest canine pseudo-epilepsy, to which the term "infectious" might be added whenever subsequent pathological study establishes this fact.

Udder Inflation

Another thing which has been of more than ordinary interest to me is the effect of udder inflation in the treatment of animal diseases. For a number of years we have been more or less familiar with results that at times seem marvelous in the treatment of parturient paresis when the udder is inflated with air or oxygen. There was a time when I gave no consideration to this method of treatment unless the case was typical of parturient paresis and occurring within a few days of or soon after calving. But as time went on, I found myself using this method of treatment in milk cows in many cases that could not rightfully be called parturient paresis or milk fever, if we consider its relationship to calving as an essential in making our diagnosis. Such cases as I refer to are characterized by normal or subnormal temperature, incoordination of gait or else the cow being unabble to stand, and marked depression going on to a state of complete coma, the bowels in some cases being inactive and in others decidedly loose. While in a recumbent position, the cow usually maintains a posture typical of the ordinary case of milk fever. These symptoms may be present at any time during the gestation period or even when she has not been carrying a calf for several months. Usually such cases are referred to as toxemia and the history is such that the condition may rightfully be attributed to some dietary cause. At any rate we are safe in saying that parturition in many of these cases is not a factor. Yet my experience has been that a very large percentage of these cases readily respond to the ordinary milk-fever treatment. This with me has become so firmly established that whenever, to use the common expression, "the cow is down or nearly down," and the case is acute and not of traumatic or infectious origin (specific), the inflation of the udder becomes the important part of the treatment. This may appear to some as being on the verge of empiricism. However, I can answer this by asking whether the pathology of parturient paresis and its treatment have ever been explained to your entire satisfaction?

Another observation along this line which I believe has some practical virtue is the ability to prevent typical parturient paresis by maintaining the udder in a partially distended condition both before and for several days following parturition.

This, of course, is accomplished by not milking at all a short time before and only partly for a few days after the calf is born. It is only reasonable that this should be so, as it is simply a natural instead of an artificial means of distending the udder.

Another condition in cows which has responded with at least a fair degree of success are strictures or fibrous teat obstructions. By repeated inflations bringing about a continuous stretching of the lumen of the teat gradual but satisfactory improvement has occurred. When we take into consideration that ordinary surgical interference in cases of this kind is far from satisfactory, we have reason to expect far better results from the inflation method.

In my experience this form of treatment has served a very useful purpose in the treatment of eclampsia in bitches. The teat orifices in bitches can not readily be entered, consequently the inflation apparatus is adjusted with a fine hypodermic needle and inserted deep into glandular tissue for the inflation of each section of the mammary glands. This treatment is further supplemented by the administration of hypodermic injections of apomorphia. I should state in this connection, however, that in a few instances I have observed sudden deaths, which I attributed to a puncturing of the blood vessel, bringing about emboli with fatal results. In order to avoid this, instead of inflating the mammary glands, I have more recently resorted to the inflation of the uterus. This can be done by introducing a suitable tube through the vagina directly into the neck of the uterus and then holding the lips of the vagina firmly with the fingers for a period of fifteen or twenty minutes.

I will cite a case incidentally coming under my observation several years ago—to be more specific, in the spring of 1913—which I consider interesting from the standpoint of the subject under discussion. The wife of a very close friend of mine was confined and subsequently developed a very severe case of puerperal eclampsia. In spite of the efforts of several good physicians, she gradually became worse and a fatal termination was anticipated at any moment. The physicians, who were also my personal friends, stated that they had exhausted every method of treatment. I availed myself of the opportunity to suggest that they try the inflation of the breasts with oxygen. Within twenty minutes they had the oxygen tank ready and were administering the treatment. Within 30 minutes more

the afflicted woman showed marked signs of improvement, which continued to a rapid and uneventful recovery.

I believe that I have brought out enough to emphasize the rather wide range of usefulness for this method of treatment. There are, however, a few things that should not be underestimated. First, the importance of an absolutely aseptic technique, and second, discard air and use only oxygen. I am an advocate of oxygen because it lessens the possibility of contamination, the cost is not prohibitive, and it is much easier to administer and gives more satisfactory results. The greater respect which it commands from your client should at least make the use of oxygen worth while.

BRAHMAN CATTLE FOR THE GULF COAST

A Brahman bull has been purchased for the Iberia Live Stock Experiment Farm which is conducted by the United States Department of Agriculture at Jeanerette, La. There is a general belief among some cattlemen in certain sections of the southern coastal region of the United States that the progeny of grade Brahman bulls of desirable type have certain outstanding merits that make the use of these bulls on native and grade cows preferable to the use of sires of better-known beef breeds.

Several points favoring Brahmans are claimed by the producers. Among the more important ones it is claimed that Brahman cattle withstand the insect pests and diseases prevalent in the low and damp areas and that they withstand the heat during the summer season better than the recognized beef breeds. It is also claimed that fewer bulls per hundred cows is necessary where Brahman bulls are used, and the basis for this statement is attributed to the vigor and vitality of Brahman bulls.

The work at present is to compare the merits of a purebred bull of a breef breed and a Brahman bull as sires for a herd of grade beef cows in the South.

BEFORE AND AFTER

As the old darkey said, "A chicken am de most usefullest animule there be. Yo' can eat him befoah he am bohn an' aftah he am dead."—*Life.*

TUBERCULIN TESTING THE DAIRY COW[1]

By W. F. Miller
Stuttgart, Arkansas

THE EXTENT and rapid increase of bovine tuberculosis has, during recent years, caused alarm, and rightly so, because of its effects in reducing the general food supply and its great danger to human health. Admitting, as we must, the increase of this disease among our food-producing animals, particularly cattle and swine, it appears that this fact should cause as great concern from a practical health standpoint, irrespective of the direct communicability of tuberculosis from animal to man. The important question as to whether bovine tuberculosis can be directly communicated to man has attracted considerable attention in this country for several years and has been discussed at several medical meetings and by scientific men generally for the past several years. The conclusion has been reached by the most advanced thinkers and writers that bovine tuberculosis is readily transmitted to man.

Of all the diseases that affect humanity, tuberculosis is the most fatal. It has been conservatively estimated that each year there are 1,095,000 deaths from this disease throughout the world, representing 3,000 each day, two for each minute. In the United States there are, according to Dr. Frederick L. Hoffman, Actuary of the Prudential Life Insurance Company, 150,000 deaths annually at an average of 35 years of age. A pamphlet issued by the Prudential Life Insurance Co. says: "Each of these deaths represents a loss of 32 years, so that the loss of life, if measured in time units, annually amounts to the startling total of 4,800,000 years. In terms of earning capacity the loss can not be set down at less than $240,000,000 annually from this disease in the United States alone."

In Arkansas there is a loss of approximately 3,000 human beings from tuberculosis annually, affecting chiefly young men and women between the ages of 20 and 30, and at any time approximately 25,000 people in the State are totally or partly incapaci-

[1] Presented at the meeting of the Arkansas Veterinary Medical Association, Little Rock, June 9, 1922.

tated by reason of the prevalence of tuberculosis. Ten per cent of the patients in one sanitarium at Denver are from Arkansas. Tuberculosis kills as many people, young and old, as diphtheria, croup, whooping cough, scarlatina, measles and typhoid fever taken together. Therefore, it is a social problem worthy of our serious consideration. During the past few years this problem has been receiving an increased amount of earnest attention. Only a few years ago it was neglected, and there was, in fact, no social effort being made to combat its ravages, whereas at the present time there is a well-organized movement looking to the eradication and prevention of this terrible disease. People are being educated and instructed how by proper precautions the afflicted may be cured and the well prevented from contracting tuberculosis.

It is an undisputed fact that tuberculosis can be acquired by ingestion as well as by inhalation and inoculation, but until recently the part played by cow's milk in the transmission of this disease has not begun to receive serious consideration. That many persons, both old and young, have been infected with tubercle bacilli through the milk of cows suffering from this disease is one of the best attested facts in modern pathology, but the extent to which children are the victims of this plague is only now being recognized. Many of the leading conservative authorities have long held that feeding upon milk from tuberculous cows is one of the causes of infection to which close attention should be given. Prof. von Behring goes very much further and says that the milk fed to infants is the chief cause of infection. Dr. E. F. Brush, one of our best authorities, regards all tuberculosis as being of bovine origin.

In conclusion, I appeal to every veterinarian in the State of Arkansas to urge the tuberculin testing of dairy cattle.

Dr. Mason Weadon of Washington, D. C., who graduated from the University of Pennsylvania in the class of 1922, has located at Vero, Florida, where he states a better opportunity is offered for veterinary work than one would imagine.

Dr. Weadon is also interested in a large citrus fruit grove and a chicken ranch and is optimistic about the rapid development of his locality.

A COMPARATIVE STUDY OF HUMAN GRIPPE AND CONTAGIOUS PLEUROPNEUMONIA OF THE HORSE (EQUINE GRIPPE)

By Dr. E. Bemelmans, *Tilbourg, Holland*[1]

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(*Continued from the September* Journal)

III. Bacteriology

In spite of bacteriological researches undertaken on many sides since the beginning of the twentieth century, no one has succeeded in establishing the etiology of the so-called contagious pleuropneumonia of the horse.

Before Schütz, who, as a result of his researches in 1887, considered the diplo-streptococcus as the cause, Friedberger in 1874, as well as Siedamgrotsky, appear to have already determined the presence of a coccus by the microscopic examination of the pleural exudate. Peterlein, Perroncito and Brazzola, and also Mendelsohn, found in the hepatized lungs of horses diplococci analogous to those of man.

The investigations of Rust (1887), Hell and Foth (1888), Chantemesse and Delamotte (1888), Cadéac (1889), Fiedler (1891), Falke and Silvestrini and Antonini (1899) confirmed the opinion of Schütz.

Some experimentalists succeeded in provoking a pneumonia in horses by means of an injection of cultures of diplo-streptococci into the lung (Schütz), as well as in the trachea (Hell). Cadéac succeeded equally with donkeys, while Fieldler, according to his writings, provoked typical pleuropneumonias with pure cultures.

In opposition to this group of investigators are those who attach a greater importance to the ovoid bacillus as the etiologic factor of the disease.

The high mortality among horses of the Parisian Omnibus Company was the cause of Pasteur himself directing his atten-

tion to the disease in 1881. Pasteur inoculated guinea-pigs with the nasal secretion. These succumbed, and from various organs he obtained oval bacilli in pure cultures and which presented a great analogy with the bacillus of fowl cholera. However, Pasteur never considered these ovoid bacteria as the cause of the affection.

In 1890 there were published the results of Babes' investigations, which he considered as the continuation of those of Pasteur. Babes found in the lungs of horses, in addition to diplo-streptococci identical with those determined by Schütz, some oval bacilli whose morphologic and pathogenic characters conformed largely to those of the oval bacillus of rabbit septicemia and fowl cholera (of the hemorrhagic septicemia group). Direct injections of these oval bacilli into the lungs seemed to provoke pneumonias with necrotic foci and which were fatal.

Lignières interprets in the following fashion the action of oval bacilli associated with the diplo-streptococci of Schütz: The oval bacilli invade the equine organism only at the beginning period of the disease, preparing the ground for the action of the diplo-streptococci of Schütz and then quickly disappearing.

As is known, the absence of Pfeiffer's bacillus of influenza in fatal cases of human influenza is explained in an analogous way. As for the significance of the oval bacillus (coccus) of equine grippe, my bacteriologic researches have proved that these germs are found in the course of this affection in the respiratory apparatus; their presence, without any doubt, is sporadic. The researches of Ostertag and Troester, of Bongert and Grabert, of Pfeiler, of Robert Koch, of Gaffky and Luhrs, have shown decisively that one must not attribute to the oval bacilli of Lignières any causative rôle, either for the malady called contagious pleuropneumonia with a normal progress, or for the pneumonia with complications.

From what precedes it follows that until 1900 investigators did not aim to discover the germ which essentially provoked the affection, but their chief aim was to discover what microbes were the cause of the pulmonary complications. Generally this secondary pulmonary inflammation was considered as a primary contagious pneumonia and not as a complication.

After 1900 reaches were instituted, especially in Germany. It is interesting to state that since that time it has no longer been

a question of the oval bacillus as a cause of the secondary pneumonia. It may be admitted as proved that in different regions the secondary infections of the lungs, which occur in the course of equine grippe, are provoked chiefly by two germs—the diplo-(pneumo)-streptococcus and the oval bacillus. The presence of the first is always more frequent. If the second bacillus is observed, diplo-streptococci will be noticed at the same time.

At the end of the twentieth century the study of the affection was entrusted chiefly to Professors Ostertag and Troester. Troester's investigations, treating especially the experimental production of contagious pneumonia, were negative. Ostertag likewise obtained no results.

As contagious pneumonia always presented a great danger to the combative force of the army, Robert Koch received the governmental commission to begin research on the cause of this affection. It was hoped that the question would then be cleared up. However, such was not the case, for the results obtained by Koch contributed nothing new concerning the nature of the disease.

In particular, Koch was able to attribute to diplo-streptococci only a causal rôle of the secondary affection, although frequently found in the respiratory tract and the lungs, because—

1. It was impossible to produce the so-called pneumonia with a pure culture of diplo-streptococcus;

2. In some cases, which moreover were very acute, their presence in the lungs could not be detected.

Likewise the disease could not be provoked with other bacteria, particularly the oval baccillus found in the affected lungs.

This eminent experimenter also carefully investigated, as was his custom, whether other animals might eventually be taken into consideration as carriers or transmitters of the virus, as had been previously supposed. Mice and rats treated with the excrement of pleuropneumonia sufferers never became ill. It was the same with healthy horses receiving with their rations the excrement of mice and rats, as well as insects taken in the contaminated stables. Flies, gnats, spiders, coleopteras, bugs and other insects found in the infected stables were transported, together with some dust, into other stables which were not contaminated and were placed on healthy horses, without a single infection being produced. The results were likewise negative

with the only insect which sucks the blood, *Hematopinus macrocephalus,* an insect commonly found on horses. At the end of his report Koch declared that the question of the nature of contagious pneumonia remained absolutely unsolved.

After the death of Koch, Prof. Gaffky received the commission to continue the research. This investigator, in collaboration with health officers and military veterinarians, instituted new, extensive microscopical researches, utilizing the most recent methods. He examined 523 organs and more than 4,000 microscopic preparations fixed and stained by different methods. Cultures executed in different ways and on a large scale gave no result at all. The cultivated germs did not differ from those found in healthy horses and were not in a condition to provoke the disease. For his investigations Gaffky utilized young horses which had never had an attack of contagious pneumonia. Like Koch, Gaffky arrived at the conclusion that it was impossible to infect rabbits, guinea-pigs or colts by the administration of secreted products or the organs of horses which have succumbed to the disease; neither could it be done by utilizing rats or mice as intermediary animals. Experiments with insects and parasites found in the stables also gave negative results.

As for my opinion, I am certain that the infection is not produced by the intermediation of insects. Fleas or bugs are found seldom or not at all on the horse. A rapid propagation by lice is impossible. In autumn, winter or spring, when contagious pneumonia is usually prevalent, there are no flies or gnats. For this reason it has been considered useless to institute other experiments with insects as transmitting agents.

Such was the state of investigations when I was charged with the study of this disease. No one doubts that the hope of obtaining any better results was slight. My researches were founded upon—

1. Bacteriologic examination of the air expired, the blood, the excretions, the exudate, and different organs of animals affected with or having succumbed to the so-called contagious pneumonia.

2. Experimentation on animals, relative to the transmission.

3. Experiments relative to the transmission of human grippe to horses, etc.

4. Injections of Pfeiffer's bacillus into horses.

1. *Bacteriologic Examination of Different Products from Animals Affected with or Dead from Contagious Pneumonia*

The results obtained may be summarized thus:

a. Air expired. In cases with normal progress, as well as those with pulmonary complications, the presence of diplo-streptococci in the air expired by the sick was determined several times. This was accomplished by means of plates of serum-agar.

b. Blood. Numerous examinations of blood from the jugular veins of horses affected with normal forms of the disease and of subjects which were on the road to recovery did not permit the determination of the presence of germs, either microscopically or bacteriologically. Only at the time of severe complications, when signs of the danger of death were manifested, diplo-(pneumo)-streptococci were observed as a general rule in the blood during the twenty-four hours just preceding death.

c. The rusty mucous discharge which drained in small quantities from the nasal cavities at the time of the existence of symptoms of pneumonia appeared to contain generally diplo-streptococci, white and lemon staphylococci, *Bacillus coli,* sarcinæ and *Bacillus pyocyaneus.* The presence of *Bacillus ovale* appears to be very sporadic.

d. Laryngeal mucous membrane. The second day after the temperature had attained 41.2°C. (in 24 hours and two bounds), tracheotomy was practiced on a subject attacked with contagious pleuropneumonia. Some laryngeal mucus was collected by means of a cotton swab fixed on a metallic rod, and this was immediately treated bacteriologically. In it there were constantly found diplo-streptococci which were very virulent.

e. Transudate. The bacteriological examination of the pleural transudate from the thoracic cavity of horses whose recovery was complete in a short time was negative. The coloration of the pleural effusion was the same as that of bloody serum. That this fluid is a transudate and not an exudate is obvious from the quantity of residue after desiccation at 105°C. It contains only 4 per cent of solids.

Frequently repeated examinations of the blood as well as of the pleural transudate immediately after their extraction always gave negative results. The presence of microbial germs or of

protozoa could not be determined. The culture media utilized were broth, serum-bouillon, agar, serum-agar, and serum from coagulated blood.

The diplo-streptococcus was found in the blood of the lungs as well as in the pleural exudate of horses which had succumbed to grippal pleuropneumonia. This was especially the case in three horses which had died from empyema.

In these cases the color of the pleural exudate was a dirty red. Mice in which some of this exudate was injected succumbed in 36 hours in consequence of a diplococcic septicemia. The presence of diplo-streptococci and especially of streptococci (short chains of 4-6 cocci) in the pleural exudate was verified.

f. Synovia of the tendons. At the remount depot I had occasion at different times to perform a bacteriological examination of the synovia from ordinary tendinous synovitis. I never succeeded in finding germs in it.

g. Lungs. The examination of the lungs of horses which had succumbed following pneumonia and whose lungs had been sent to me from various regions of the country was profitable. The bacteria found after a complete bacteriological study were: Diplo-streptococci (cultivated in a liquefiable medium under the form of small streptococci), staphylococci, (white, golden and yellow), sporadic oval bacilli, sarcinæ, *Bacillus subtilis, B. pyocyaneus* and *B. coli.* The presence of diplo-streptococci and staphylococci was always predominant.

The above-mentioned bacteria may also be found at different times in the nasal mucous discharge of healthy horses. The microscopic examination of smears obtained from different organs, such as lymph nodes, heart, liver, spleen, kidneys, gave no appreciable result. It was the same with preparations stained by the various methods used for recognizing protozoa (trypanosomes and spirochetes) of the blood and other organic fluids.

2. *Animal Experiments to Determine the Transmission of Contagious Pneumonia (Grippe) of the Horse.*

a. Mice inoculated hyperdermically with the rusty nasal mucus usually died in forty-eight hours. From time to time staphylococci could be cultivated from the heart. More often the mice appeared to die as a result of a diplo-streptococcic

septicemia, and sporadically only from a septicemia due to the oval bacillus.

b. Mice inoculated with the secretions from the upper respiratory tract (secretions obtained aseptically by tracheotomy) usually succumbed in twenty-four hours from a diplo-streptococcic septicemia.

c. Injections of blood, collected on different days from horses attacked with the typical affection with a normal course, are accomplished as follows:

(1) Mice—subcutaneously;

(2) Guinea-pigs—subcutaneously;

(3) Rabbits—subcutaneously and intravenously;

(4) Horses—subcutaneously, intravenously, intratracheally and intrapulmonarily;

—and always with the same result.

d. It was likewise impossible to provoke the least reaction in these animals by means of the pleural transudate. After twenty-four hours only an absorption could be observed in horses that had been injected with the exudate of tendinous synovitis, which was manifested during the course of the affection or the convalescence.

e. The dirty red hemorrhagic fluid of the pleural effusion, injected at different times by venous or intratracheal means, did not provoke the disease.

This pleural exudate had been obtained aseptically from the horses affected with the disease, either before or after death. The presence of diplo-streptococci could always be detected there.

A colt which it was certain had never had pleuro-pneumonia was (1) injected by the intratracheal method with 10 c.c. of pulmonary material obtained in the following manner: A fragment of lung from a horse which had died from grippal pleuro-pneumonia was cut aseptically into small pieces and triturated in a mortar with a solution of sterile sodium chlorid. To separate the solid particles the mass was filtered through a layer of cotton. With this filtrate the subject was inoculated by means of an intratracheal injection. It provoked no reaction. (2) Taking another colt, I injected into the lung 10 c.c. of this filtrate, which, like that used for the intratracheal injection,

contained diplo-streptococci, staphylococci and *Bacillus subtilis*. The result was only a weak thermal reaction of 1.2°C., lasting scarcely twenty-four hours.

This filtrate was injected into the veins of a four-year-old horse with negative results. Several repeated trials produced the same results. It is therefore impossible to infect horses with the blood, pleural exudate or tendinous synovia of horses attacked with grippe and recovering from it, even though it is proved that the animals used in the experiment are not immune to the disease.

It was thus impossible to produce the affection by means of a pulmonary exudate and lung fragments of dead horses in which diplo-streptococci as well as oval bacteria were found. Thus it seems impossible artificially to infect healthy receptive horses.

There is no reason for making experiments with filtrate obtained by passing blood and secretions through bougies, since from what preceded it is seen that a filterable virus may be excluded as a cause of the disease.

Summarizing, it is then proved: (1) That the so-called contagious pleuropneumonia of the horse is not a bacteriemia; (2) that the causal agent of the affection is absolutely not filterable.

Neither Ostertag nor Koch having succeeded in provoking the disease in healthy horses, with pure cultures nor with the diplo-streptococci of Schultz nor with the oval bacteria of Lignières, it was useless to repeat these attempts on costly experimental animals.

Moreover, Pfeiler (6) had decided that question. Pure cultures of diplo-streptococci as well as of oval bacteria were injected into twenty-four horses, in different ways, separately or mixed. From these attempts Pfeiler thought he should conclude that he had succeeded in provoking pleuropneumonia in horses by intravenous injections of the diplo-streptococci of Schutz.

Ostertag did not reach such a conclusion. The results of some of his experiments were interesting, in so far as he provoked complications such as tendinous synovitis and intraocular inflammations, as well as foundering. As we have previously seen, these complications are observed in contagious pneumonia of the horse.

3. *Experiments on the Transmission of Human Grippe to Horses*

After I had the assurance that clinically human grippe was identical with contagious pneumonia (grippe) of the horse, as much in its abortive form as in its normal or complicated form, I could not resist taking the occasion to see if human influenza was eventually transmissible to the horse. I did not hope for much from these attempts, because of the fact that no one has ever succeeded in transmitting contagious pneumonia from a sick horse to another receptive.

The sputum of men affected with a noncomplicated grippe, as well as the expectoration of those sick with a complicated pneumonia, were administered to horses, mixed in the drinking water and the feed. In this manner I did not succeed in provoking the least reaction among the horses.

The same was true of deposits of these excretions in the nasal openings or superficial rubbings on the nasal mucosa. After intratracheal injection there was produced a slight elevation of temperature, but this lasted for only a few hours. From these experiments, then, it results that it is not possible to transmit human grippe to horses by means of the sputum and excretions from subjects attacked with the typical affection.

4. *Injections of Cultures of Pfeiffer's Bacillus Into Horses.*

The numerous bacteriological researches instituted concerning contagious pleuropneumonia of the horse are all the more interesting since eminent bacteriologists such as R. Koch and Gaffky have concerned themselves with them. It is true that at that time the question of the identity of this affection with human influenza was not even established, but the worth of these scientists is a sure guaranty that they would not have misconstrued the analogies of the different organisms which they found with Pfeiffer's bacillus of influenza if these analogies had existed.

Neither have I succeeded in determining the presence of the influenza bacillus in the respiratory apparatus, whether that of a healthy horse or of one affected with contagious pneumonia. As is known, this bacillus requires a special culture medium for development. It is not cultivated in the blood of a horse. Even in the preferred media (pigeon blood, human blood) it dies

quickly and necessitates frequent transplantations to preserve its vitality. The formation of toxins in these media has not been mentioned at all, for the reason that I have never been able to attribute any importance to this supposed bacillus of influenza as a generator of grippe, because the symptomatic picture of grippe incontestably indicates that it must be provoked by toxins produced in the course of the disease.

I have concluded, first, that by injections of virulent cultures of Pfeiffer's bacillus it would be impossible to provoke contagious pleuropneumonia of the horse. Indeed, the transplantation into the nose of these cultures, superficial rubbing on the nasal muscosa, as well as intratracheal injections, gave no result.

In spite of very numerous investigations, no one has yet succeeded in discovering the specific virus of human grippe or of contagious pleuropneumonia of the horse.

It is known that Pfeiffer in 1891, in many cases of grippe, found in the sputum great quantities of a bacillus which he considered the casual agent of the disease. Numerous articles have since then been published on the rôle of this bacillus, particularly during the epidemic of 1918. It has been asserted that in certain regions Pfeiffer's bacillus was frequently found in subjects affected with a grippal pneumonia; though often few in number at the beginning of the disease, these bacilli become very numerous during the progress and at the end of the disease. In other regions these germs are not found at all or only exceptionally. Pfeiffer himself was able to find his bacillus in only 51 per cent of his cases.

These germs are not found in very acute cases of grippe (Schottmueller). Thus many bacteriologists arrived at the conclusion that Pfeiffer's bacillus incorrectly bore the name of "influenza bacillus." This is true of Prof. Friedman, who did not hesitate to admit the existence of epidemic affections presenting the symptomatic picture of influenza and nevertheless entirely independent of the bacillus of Pfeiffer. Pritschett and Stilman (7) in 43 per cent of their cases isolated bacilli of influenza from the sputum of healthy individuals. Kensella (8) points out the presence of these germs in the pharynx of healthy individuals, without any epidemic diseases of grippe. Moreover these bacilli have been found in the pharyngeal and pulmonary

lesions at the time of pneumonia, whooping cough, measles, and scarlatina, as well as in other pathological conditions without grippe, particularly during endocarditis, meningitis, conjunctivitis, dysentery, etc.

A number of reputed and experienced bacteriologists, such as Schmorl, Oberdorfer, Kruse, Kolle and Selter, did not recognize any causal rôle of Pfeiffer's bacillus in human grippe. Rumpel, Selter and Paltauf discovered Pfeiffer's bacillus in the upper respiratory tracts of various patients presenting no symptoms indicating influenza.

Pfeiffer has personally claimed that the bacilli of influenza are found, sometimes even in a large quantity, in the sputum of tuberculous patients, of individuals affected with a chronic bronchitis and with bronchiectasis. These germ carriers do not suffer at all from the grippe, no more than persons found in their immediate vicinity.

Attempts made by Pfeiffer to transmit influenza to the monkey failed; a simple thermal reaction was produced, but not genuine grippe. Other investigators injected virulent cultures into the trachea and lungs of monkeys but had no better success. The bacilli die quickly; they appear to act only through intracellular toxins liberated at the time of their death. The monkeys succumb, presenting collapse and dyspnea. By injections into the veins and peritoneum, strong doses of cultures killed rabbits and guinea-pigs.

Horst (9) performed numerous inoculations with cultures of the influenza bacillus on rats, guinea-pigs, mice, rabbits, cats and pigeons. The result was always negative. Thus it follows that Pfeiffer's bacillus possesses no severe pathologic action, a fact which I have equally established for the horse.

It is to be considered, moreover, that in cases of grippe where the presence of the influenza bacillus has been demonstrated the progress of the disease is not more severe.

Experiments instituted on man have likewise given no result. Thus Yamanouchi, Sakakami and Iwashima (10) injected a culture of Pfeiffer's bacillus into the noses and throats of a certain number of individuals. None of these manifested any symptoms of influenza.

We must also remember the failure of Uhlenhuth's attempts to put into evidence specific aggultins in the blood serum.

Finally, McConnell (11) contests the theory of Pfeiffer's bacillus as a cause of the affection with the following argument: The nonmodification of the number of leucocytes after the injection of this bacillus, while in influenza a leukemia is produced.

For these various reasons I believe that it is wrong to consider Pfeiffer's bacillus as a causal agent of human influenza. No causal relation exists between these bacilli and grippe; they may be regarded only as companions of the human organism. If they are present, they lead an existence of saprophytes and await a favorable occasion for multiplying rapidly and for preparing the soil for other germs with which they live in symbiosis.

As far as human grippe is concerned, I attribute to the bacillus of influenza only a secondary importance, entirely comparable to what occurs in contagious pleuropneumonia of the horse and also in grippal pneumonia in man (Orticoni, Barbier and Auge, 2).

IV. EPIDEMIOLOGY

The idea that human grippe always rages as a pandemic throughout all the country should no longer be accepted. All who have studied the disease unite in admitting that catarrhal affections and febrile catarrhs rage under an epidemic form at the beginning as well as the end of each year, due usually to changes in the temperature and other atmospheric influences.

The so-called contagious pleuropneumonia of the horse is also prevalent regularly each year among young horses wherever many of these animals are assembled.

These are some epidemiologic facts which present a great importance to the etiology. For the beginning of the disease also there exists a manifest analogy between the human and equine diseases.

Thanks to the regular recording of the temperatures of the young horses after their arrival at the remount depot, I have been able to form an exact opinion of the beginning of this disease. Since 1886, the year of the installation of the remount depot, contagious pneumonia has raged every year among the young horses. The manner of the onset is identical, as a general rule. There are differences only in the date on which the first cases appeared. In this respect several factors intervene: (1)

Condition of the horses upon their arrival; (2) meteorologic conditions which follow stabling; (3) the hygienic condition of the stables where the animals are kept.

If horses stay too long at pasture there results a loss of weight. Changes in the upper respiratory passages are then produced, especially if meteorologic conditions are unfavorable. The duration of the development of the contagious pleuropneumonia is in direct relation to these different factors. The mild, nasal and pharyngeal catarrh which horses exhibit on their arrival at the stables, after their return from the grass lands, induces the affection and greatly influences the evolution of the disease.

If meteorological conditions are unfavorable after confining the horses in the stable; if it is impossible, for example, to take them out on account of rain, or if the quarters are not adequately ventilated, we see the cases of nasal and pharnygeal catarrh multiply, particularly in stables presenting the least favorable hygienic conditions. It is in these surroundings that sometimes after two or three weeks typical cases of contagious pneumonia (grippe) appear.

If, on the contrary, the horses return from pasture in a better condition, if the meteorological conditions before and after quartering are favorable and permit long stays in the open air, if the stables are well ventilated, weeks will pass without a single suspicious case being found, the animals eating well and not coughing at all.

As a general rule, for a short time some horses in different stables refuse a part or all of their feed, cough a little, and show an elevation of temperature. Frequently the disturbance disappears in 24 or 48 hours. A few days later other horses leave their feed. This is repeated. In the most poorly equipped stables, in which the first cases have been observed, new cases are presented, the symptoms increase, and cases with severe complications may then be noticed.

Horses apparently healthy when leaving the pasture thus bring the virus. It is inadmissible that the cause of the infection is found in the same stable, considering the fact that each year all the stables are cleaned and disinfected before the arrival of new horses.

As for the extension of the grippe among young horses, I have

ascertained the following: The first cases of pharyngeal catarrh without general symptoms are found in the weakest subjects. It is only a little later, when the virulence of the microbian agent has been enhanced by several passages, that examples of transmission are observed in vigorous subjects. Then the manifestations increase, general phenomena are added to local symptoms, and the nervous determinations predominate.

The largest number of cases of the disease are noticed during humid, rigorous weather, with a great amount of wind or storm. Sundays and holidays, when the horses remain in the stables and when the temperature and ventilation are less supervised, are marked by a renewed outbreak of the disease. As a general rule, horses in the corners of the stables are the first to be attacked, because they are in the least favorable hygienic conditions in regard to light and air; they are also more exposed to currents of air. The number of cases of grippe under treatment is reduced according to the thoroughness of ventilation.

In recently built stables, complying with the legitimate exigencies of hygiene, the progress of the disease is slower and the malady continues to prevail for months; a long time elapses before all have been attacked.

It is known that the extension of the epidemic of 1889 was very slow in rural communities and that the inhabitants of scattered farms, if they did not remain free from disease, were attacked very late.

The horses which had been suffering from nasal or pharyngeal catarrh in the pasture were not attacked with grippe at the depot. To this fact must be attributed the transmission by leaps of the affection in the stables. The progress of the malady is more rapid among native horses which are brought to the stable directly after purchase from the grazier. If these subjects are placed too near each other, in a rather small and less airy stable, then we see them successively attacked in a very short time. In one case, in fourteen days all the animals of a certain stable had been infected, with the exception of a single animal which showed himself impervious to all contamination. Thus we observe a perfect accordance with human influenza. The denser the population and the more rapid the extension of the disease, the sooner it reaches its height and the more promptly it ceases its ravages. When no more cases were to be found in the larger cities (Feb-

ruary, 1890) new cases developed in the country for a long time.

As we have just specified, the number of cases of grippe is increased during humid and cold weather, especially when the animals remain in the stable for a few days. As far as differences in breed are concerned, from my observations I believe that the neural symptoms are more predominant among Irish horses, due to the sensitiveness of their nervous systems, than among native, more lymphatic subjects.

As to human influenza, it is established that middle age is more receptive than youth and old age. Individuals in full vital power, healthy and strong, are more frequently attacked. In this also there exists a remarkable concordance with contagious pneumonia of the horse.

Among colts I have observed a rapid and typical progress (for a few days only, an elevation of temperature), while the largest number of victims was among horses between 4 and 8 years of age.

In the epidemic of 1889-1890, as well as in that of 1918, relapses were comparatively rare. At the time of the first epidemic they occurred in the proportion of 8 per cent of the cases treated. The majority of doctors believe that they are due to reinfection. They have never observed among their numerous diseases a single new cast of influenza. Egon Frey (12) said that persons who had been affected with the disease in the summer of 1918 were generally spared during the autumn epidemic. From this it is reasonably concluded that the two epidemics depended upon an identical infection. Hamilton and Leonard (12) declared that in a boarding school where two epidemics had raged none of the pupils were attacked twice. More often an immunity against a new infaction existed for a comparatively long time. This is also true of the analogous disease of the horse. Of the 46,431 cases which were noticed from 1893 to 1913 among German army horses, only 0.04 per cent were taken ill a second time.

During the sojourn of young horses in the remount depot, relapses occurred very rarely. About 200 three-year-old horses were there two years. If they were attacked with contagious pneumonia the first year, as a rule none of them were attacked

the following year. An absolute immunity does not always exist for the rest of their lives, but certainly a partial immunity. A proof of this is found in the rudimentary progress of the affection among old horses. These suffered from contagious pleuropneumonia in their youth in the remount depot. In this respect, again, there is an analogy with human grippe.

In regard to the immunity against grippe Netter says: "It seems, nevertheless, that a first attack procures a relative immunity. The employees of the customhouse and postal service of London who were attacked in 1890 were attacked in 1892 in a proportion two times less than those who had escaped the first epidemic."

As I have said, I also have noticed a partial immunity from this disease among colts. By taking the temperatures of all the horses regularly, it results that the sudden fever of 40° C. more or less is maintained for only a short time with some subjects, to return to normal after twenty-four hours. This is observed in the absence of other pathological symptoms. A little later, sometimes even a few days, the horses again appeared infected and suffered from contagious pneumonia.

During the epidemic of 1889, 37½ per cent of the population were attacked with influenza. Of this number 2.67 per 1,000 succumbed, which places the total mortality at about 1 per 1,000.

The mortality is also low for contagious pneumonia if the affection is diagnosed early and the sick are isolated and placed in the most favorable hygienic conditions. Then the chances are great that the disease will progress normally and no complications will be produced.

The mortality is greatly reduced by the use of salvarsan; by its early utilization the losses have even fallen to 0.3 per cent. Just as in man, the majority of the fatal terminations are the consequences of disturbances of the respiratory and circulatory systems.

I have already emphasized that in recently built stables of the remount depot, presenting good hygienic conditions, particularly in regard to dimensions, ventilation and lighting (sunlight), the affection appeared only tardily, its progress was rather slow, and it was a long time before all the animals had been attacked.

In crowded stables, on the contrary, where the animals did not have the necessary amount of air, the affection appeared sooner; the progress was more rapid and it brought more severe pulmonary complications.

Before my arrival at the remount depot it was the custom to place the first horse taken ill in the box stalls of the stable. Many succumbed there in consequence of insufficiency of aeration and lighting. For such affections I consider boxes as tombs.

Cases were found in the stables of the field hospital units of the countries at war, and often where the horses were crowded together the mortality rate rose greatly. On the other hand, at the front, where the horses were in rustic conditions and thus toughened, the malady raged with only a very weak intensity.

These assertions are to be compared with those made concerning human grippe. Head (14) has shown that in a group of patients treated with windows open and in the cold the mortality was more than half lower than that computed for another group of patients cared for in closed, warm rooms. Frey (12) recommends not crowding severe cases of influenza in the hospitals in such a way as to transform them into mortuaries.

The crowding in hospitals of influenza patients with severe complications results in an augmentation of the virulence of the influenza germs; to this should be attributed the death of so many hospital attendants. Proportionally the number of victims is much less among physicians, although they may have been in contact with severe cases. The resistance of doctors must be explained by their intermittent stay in the open air.

Thus it is not doubtful that human influenza and contagious pneumonia of the horse are contagious diseases. The reasons upon which this opinion is based are identical for the two diseases: Typical symptomatic picture; acute progress, sometimes very acute, among men and horses living in crowded conditions (large cities, remount depots, trading stables); great depression follows a short attack of the disease; subsequent immunity, etc.

It must always be remembered that the infection often progresses in a very strange manner. Thus at the remount depot months sometimes passed before contagious pneumonia made its appearance in a stable situated between others where the af-

fection raged intensely. Moreover, the malady did not become extended to the horses of farmers near the depot, and yet a very large number brought fodder and feed there every day.

We also know that it has not been possible to transmit the disease experimentally. Likewise, infecting a stable by introducing some sick animals there has not succeeded at all. But as to this subject I have noticed a very remarkable fact. A sick horse with severe complications is placed in a stable where no case has been observed. The horses quartered in this stable remain well. A few months later when the depot no longer contains a single sick horse, a case of pneumonia is found in one of these nonreceptive horses, soon followed by 25 other cases.

As for the treatment, it is useful to emphasize the excellent effects of salvarsan. Thanks to this product, the disease has almost always a short and benign course, but its use, even very early, does not prevent the spread of the disease.

Experimentally, contagious pneumonia of the horse seems to be of an autochthonous nature. It may be provoked. For this it is enough to assemble young horses in a stable, ignoring hygienic conditions, especially lighting, aeration, ventilation, orientation, etc.

Upon the whole, I believe I have demonstrated that human influenza and contagious pneumonia of the horse are epidemiologically identical.

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CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

A CASE OF TRUE OSSIFICATION OF THE AORTA IN A BOVINE [1]

By MIGUEL C. RUBINO

Technical Veterinary Inspector and Delegate to the Institute of Pathological Anatomy and Parasitology of the Veterinary School of Montevideo

THE PRESENT CASE as described, although it lacks practical interest, because we have not been able to obtain data on the subject and because it may furnish a new observation, may also be of importance in future investigations. At the same time the alterations that we describe not only on account of their nature but their extensions, we believe have not been reported in veterinary medicine.

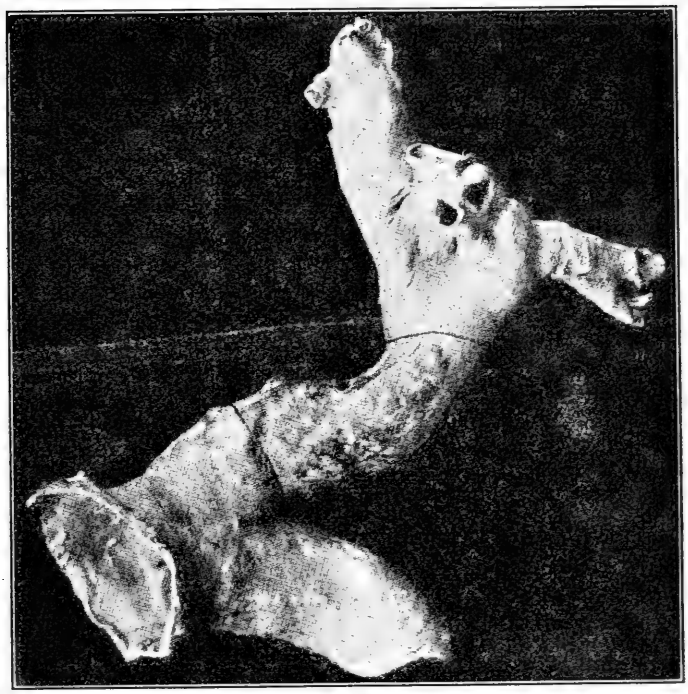
This case was a grade Hereford, seven years of age, examined August 12, 1917, in the corrals at Durazno. Dr. Felipe Castañeda was present at the autopsy and supplied the following data:

The general condition of the animal was good, but on being exercised the animal became fatigued by the least exertion.

Autopsy: There was great resistance in the cutting of the carotid. Cardiac dilation was pronounced, particularly in the left ventricle, which appeared flaccid, its very thin walls forming folds. The arterial aorta in the thoracic extension was rigid. This rigidity, though in a lesser degree, continued in the abdominal aorta and in the thoracic branches of the brachiocephalic. It was difficult to delimit definitely the extension of the infection.

The thoracic portion of the aorta, which is illustrated, was taken for study. At the beginning it was thought to be a very extensive calcification of the aorta, but it was observed that in the external tunic there were calcareous concretions, and a care-

[1] Translation by N. S. Mayo of an article from the Annals of the Veterinary School of the University of Montevideo, as reported in the *Revista Medicina Veterinaria*, the official organ of the Veterinary Medical Society of Uruguay.



Thoracic Portion of Aorta

ful examination demonstrated that we were dealing with a true ossification. The artery that was presented showed complete rigidity to pressure; only some small portion appeared relatively flexible. Throughout the external tunic was observed some small white concretion of a calcareous nature. The internal surface covered by a heavy lining presented a whitish red appearance and was seeded with small rigid projections, many of them pointed.

The trunk of the aorta was totally ossified, as much as was separated, and we found large rigid plates in contact with others, except in some portions there were observed small zones that were not ossified or that were ossified incompletely. In the internal surface could be clearly observed the process of ossification by plates, because the inner surface was transparent and one could see the orders of the plates, some covering parts of others.

A microscopical examination showed that ossification took place in the middle tunic, involving its whole thickness. The

structure of the tissue is analogous physiologically to planes of flat bones. The parts that go toward the external and internal surfaces is a layer of tissue compact and is united by a spongy tissue, osteoplasms having many zones of orientation in the Haversian system.

OBSTRUCTION OF THE DUODENUM OF A HORSE BY A BILIARY CALCULUS FOLLOWED BY RUPTURE OF THE STOMACH [1]

By ANTONIO DE BONI

Chief of Technical Work in Pathological Anatomy and Parasitology in the Veterinary School of Montevideo

TAKING INTO ACCOUNT the various causes that intervene in the production of rupture of the stomach of a horse, I believe this case will be of interest, and in the description I will refer only to the most important part of the autopsy, registry No. 54, March 9, 1918.

The body of a male horse eight years old was brought to the Pathological Anatomy Institute of the Veterinary School for autopsy. The only history was that the animal had suffered from severe colic.

On opening the abdominal cavity, watery, bloody fluid mixed with food and blood clots came. Over the peritoneum were particles of food and blood clots, particularly on the mesentery, where there were large quantities. The serous membranes of the intestines contained some petechiæ. The stomach presented a rupture of 20 centimeters in its largest curvature, extending nearly to the pylorus, the irregular borders festooned and infiltrated and with coagula. There were hemorrhagic affusions in the submucous coat and the muscular coat was retracted. The mucosa on the edges of the rupture was spotted with violet and along the edges was a blood infusion and particles of food.

A small quantity of food remained in the stomach; mixed with it was a rounded calculus of a green color.

On palpating the duodeneum a hard mass was felt and on opening this organ one could see a dark green calculus, in front of the opening of the bile and pancreatic ducts (ampolla Vader), closing the opening of the same. The intestine was contracted,

[1] Translated by N. S. Mayo from the *Revista Medicina Veterinaria*, official organ of the Veterinary Medical Society of Uruguay.

making a mass in which was the calculus. The intestinal mucosa was intact. In the folds of the pocket were small calculi with facets held in position by the large calculus.

The color of the liver was gray with a faint olive tint. The liver was greatly increased in volume and very hard and difficult to cut. It could not be broken with the finger. The appearance of the surface was netlike, with a light color. In the central part of each cell was a depression with a darker color. The lighter part could be recognized as interstitial tissue, greatly increased, forming a mesh, surrounding small islands of the parenchyma; this had a reddish color.

A microscopic examination revealed the classical lesions of chronic interstitial hepatitis.

CARBON TETRACHLORID EFFECTIVE AGAINST HOOKWORMS

A telegram has been received from Fiji reporting the successful treatment of more than 12,000 hookworm cases by carbon tetrachlorid with 90 per cent of cures with one dose, and the removal of 98 per cent of the worms. This method was tried first on dogs by Dr. Maurice C. Hall, of the United States Bureau of Animal Industry, who found that 0.3 c. c. of the drug for every kilogram of live weight expelled all the hookworms of those animals, a result he had never previously obtained by any other method of treatment, while it could be given after fasting in hard gelatin capsules without purgation being necessary. As the new drug is much less toxic and far cheaper than either thymol or oil of chenopodium, the last of which has given rise to a number of fatalities owing to the uncertain amount of the active principle in different samples, these are matters of great practical importance, and the remarkable success of the trial now reported will, if confirmed by further observations, prove a notable advance in dealing with this the most widespread health and labor-destroying scourge of immense areas of the world.—*Nature, London, No.* 2743, *v.* 109, *May* 27, 1922, *p.* 688.

Drs. Brock and Williams of Dallas, Texas, suffered a heavy loss when their canine hospital was burned to the ground on August 3, 1922.

ABSTRACTS

COMBINED CARBON DIOXIDE CONTENT OF BLOOD PLASMA IN THE HORSE. Nagaoki Ijichi. Jour. of Jap. Soc. of Vet. Science, vol. 1 (1922), no. 2, p. 76.

Studies in acidosis have recently made a remarkable progress and many valuable reports in connection with it have already been published. The subject is, as is widely known, of great interest both from a physiological and pathological point of view. It would be of no benefit, however, to describe here what acidosis is or what kinds of researches have hitherto been made on the subject. For three years I have devoted myself to the study of this subject with the view of finding out its practical value in veterinary science.

As a first step in my experiments, I have measured the CO_2 content of horse blood plasma by means of Van Slyke's method which was published in 1917 and is now generally recommended as the best method for diagnosing acidosis.

The blood used for my experiments was obtained from the jugular vein of the horse, care being taken in doing so not to allow the blood to come in contact with the air. According to the studies of Stadi and Van Slyke, it is not necessary, for the measurement of the CO_2 content, to saturate the venous blood with CO_2 at the same tension as in alveolar air, if the blood is drawn from a vein without any stasis. The venous blood employed in my experiments, therefore, is not subjected to any process which was to be carried out for the purpose of saturating the blood with CO_2.

The results obtained from a number of experiments are as follows:

(1) CO_2 content of blood-plasma in the normal horse.

Experiments in 30 horses (military) show that the CO_2 content of blood-plasma varies from 72.1 to 52.8 vol. %, that is, 62.6 vol. % on the average.

It must be noticed here that even in one and the same horse there is a difference between the CO_2 content measured in the morning and that obtained in the evening.

(2) CO_2 content of blood-plasma in the horse under abnormal conditions.

(a) Fatigue.

In horses which have taken a run of about 390 km. the CO_2 content has fallen below normal, all of them being in a condition of acidosis; the content of CO_2 in 8 tired horses averages 47.0 vol. % (53.2-38.1). Comparing the condition of some excessively tired horses with that of horses in a state of slight fatigue, I have found that the CO_2 content in blood-plasma, that is, the lowered alkaline reserve, decreases according to the degree of fatigue, so the blood-plasma of the most severely tired horse contains the least volume of CO_2.

(b) Podophyllitis, colic, influenza, pectoralis, and morbus maculosus.

In podophyllitis caused by severe exercise, the CO_2 content of blood plasma decreases considerably. An examination of the blood-plasma obtained from 7 horses suffering from an attack of podophyllitis showed that the CO_2 content averages 54.1 vol. %, which means that almost all of them were in a condition of acidosis.

It is no unusual matter to find acidosis is proved in a case of severe colic. According to my measurements, the CO_2 content of the blood-plasma taken from a horse which has been suffering from colic so severely that he died several hours later, was 32.7 vol. %.

In influenza pectoralis I have found that the CO_2 content of the blood-plasma is 27.1 vol. % in its severe form and 50.0 vol. % when mild.

The blood-plasma taken from a horse affected with morbus maculosus contains 45.7 vol. % of CO_2.

(3) Chlorine and phosgen gas poisoning.

In a room which was tightly shut up, a horse was exposed for 10 minutes to chlorine gas, the concentration of which was 0.2 vol. %. The CO_2 content of the blood-plasma taken from the animal decreased from 67.3% to 49.4%, and when the blood concentration increased to its maximum the symptom of pulmonary edema was most remarkable.

After 10 minutes exposure to 5 vol. % of phosgen gas, the CO_2 content of the blood-plasma of a horse suddenly decreased from 65.2% to 20.7%. The subject died in 30 minutes from the beginning of exposure.

(4) Decrease in the CO_2 content in the case of experimental acidosis.

The application of HCl or H_3PO_4 per os gives rise to a condition of acidosis.

1000 c.c. of 5% HCl solution was given to a horse every day by means of a stomach catheter. On the 3d day it was noticed that the CO_2 content decreased from 63.3% to 27.7%. The horse died of rupture of the stomach on the 4th day.

A 10% solution of H_3PO_4 was given per os to another horse, the doses being as follows: 1st day 500 c.c., 2d day 500 c.c. and 1,000 c.c., 3d day 1,500 c.c. On the last day, the CO_2 content of the blood plasma of the animal decreased from 68.3% to 30.0%.

By applying the Michaelis solution and a 1% solution of sodium bicarbonate, the CO_2 content of the blood plasma began to increase gradually and on the 9th day the horse recovered entirely from hyperalkalinity.

(5) Limited feeding.

A horse was fed only with water for 4 days and during the next three days with a daily allowance of 2 kg. of hay in addition.

No decrease of the CO_2 content was observed.

(6) CO_2 intoxication.

A horse was shut up in an almost air-tight chamber and a certain amount of CO_2 gas was allowed to flow into it. After 17 hours when the CO_2 concentration became 7.8%, the horse manifested the symptom of severe dispnœa, but there was no decrease in the CO_2 content of the blood plasma.—(*Author's Abstract.*)

ON THE IMMUNE SERUM AGAINST FOOT-AND-MOUTH DISEASE. Susumu Kuragano and Tatsuo Mogami. Jour. of Jap. Soc. of Vet. Science, vol. 1 (1922), no. 2, p. 111.

The following is a summary of this paper:—

1. Calves subjected to a natural infection proved to be immune against subcutaneous inoculation of virulent blood carried out 20 to 34 days after their recovery. To determine the duration of the immunity produced by the natural infection further investigations are necessary.

2. Subcutaneous inoculation of blood, saliva, vesicular content, and emulsion of spleen and lymphatic gland from an infected animal produced the disease in the calves experimented on. The minimum dose of virulent blood for a calf was 2 c.c.

3. The blood-serum taken from the animal recovered from one attack of this disease was found to have a protective action which can be intensified by repeated injections of the virulent blood (100, 500, 1,000 c.c.).

4. The period of incubation in this disease is sometimes as short as 24 hours. To test, therefore, the protective action of an immune serum, injection of serum first and of virus one or two days later is preferable to the injection of both at the same time.

5. The animals treated with the immune serum in a dose of 0.53 c.c. per kilo body-weight proved to be immune against injection of 10 c.c. of virulent blood carried out 3 weeks later. To determine the relation between the dose of serum and the duration of immunity further investigations are necessary.

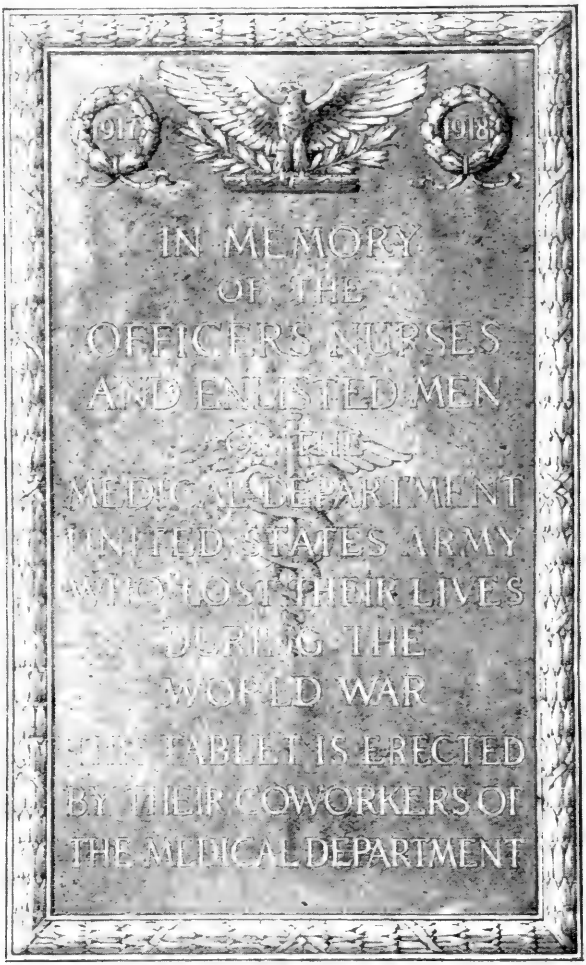
HAIRLESS PIGS AND "RAIN-WATER"

The Research Station of the Canadian Health of Animals Branch, located at Agassiz, B. C., reports that in the Agassiz valley "hairless pigs" are only known to have occurred on one farm, and only during the occupancy of the present tenant. This man has been on the farm in question for two years, and during that time has lost five out of six litters from four sows. The surviving litter, born this spring, were decidedly weak and were only saved through careful nursing. The sow was one that came from the Experimental Farm last fall and consequently had not been on the place very long. Inquiry showed that the owner had been in the habit of giving his pigs rain-water and that no other water was used for the sows. In view of the fact that previous tenants could raise pigs on the farm in question, there appears to be no doubt that the peculiar mode of watering used by the present owner was responsible for the thyroid deficiency shown. The trouble is quite prevalent in some parts of the province, and the view is quite widely held that it has some connection with snow-water; judging from the effects resulting from the persistent use of rain-water, the snow-water theory may not be without some foundation. In affected districts the use of 5 to 10 drops of B. P. tincture of iodine twice a week to pregnant sows for the duration of pregnancy will ensure normal litters.

ARMY VETERINARY SERVICE

MEMORIAL TABLET AT WALTER REED HOSPITAL

In the new Army Medical School building, which is now in course of construction at Walter Reed General Hospital, Washington, D. C., a large bronze memorial tablet will be erected. Necessary funds for this purpose will be received by popular subscription, each subscription being limited to $1.00, and the list of subscribers restricted to those who saw service as offi-



cers, nurses or enlisted men of the Medical Department of the Army during the recent World War. Each subscriber will receive an official acknowledgment and receipt. Fellow-workers desiring to subscribe for this tablet which commemorates the service of their conrades who fell while engaged in Medical Department work, are invited to forward $1.00 to Lieut. Col. Paul C. Hutton, M. C., Office of the Surgeon General, Washington, D. C.

The placing of this tablet in this great building which is located in a great medical center, can not fail to prove of vital interest to the thousands of physicians, dentists, veterinarians, nurses and enlisted men who took part in the World War, and the fact that the cost of this bronze is to be borne exclusively by those who engaged in Medical Department activities, and further it is in memory of those who fell while so engaged, should incite the feeling that a contribution of one dollar toward this worthy object is more of a privilege than a duty.

ARMY MEDICAL SUPPLIES

As part of a comprehensive study under the direction of the Assistant Secretary of War, the Medical Department of the Army is undertaking a study of the sources from which the supplies which it procures and uses can be had. The Medical Department is not only concerned with the provision of the personnel necessary to the treatment of the sick, but is also charged with the supply of those things which are required by such personnel.

The armamentarium of modern medicine is exceedingly intricate, but without it the wonderful advances made in medicine are not available to the sick and injured, however skillful the personnel. The difficulties encountered in providing such elaborate equipment in time of war for the large number of new hospitals, infirmaries and first-aid stations necessary, and particularly in providing it at those institutions in the advance area, are manifest, and yet if the soldier is to be given the service that he is entitled to, it must be provided.

In a war of any magnitude the burden thrown upon industry for the production of these supplies is enormous. Any information that could be made available beforehand to industry as to type, number and quality would obviously be of great

advantage to industry in its plans. The Surgeon General is, therefore, side by side with his plans for the extension of the Officers' Reserve Corps, with his plans for instructing medical students through the R. O. T. C. in those duties of a medical officer which differ from those of the civilian physician, determining where the supplies needed by these officers may be had, should any grave emergency arise.

This effort is an attempt to do beforehand what was necessary after the declaration of war in the recent World War. It is done in recognition of the fact that the forces of the Medical Department, however numerous and skillful they may be, will be but half prepared without the necessary equipment. In brief, the program contemplates (1) that a careful determination shall be made, not only of the items needed, but of the quantity thereof. With a close liason established with industry, it is probable that often final decision as to the type of an article selected will be determined by the facilities of industry to produce it in large quantity. (2) The plan contemplates also a roster of personnel skilled in the manufacture, inspection and purchasing of the various commodity groups. It is desired to secure from industry itself men who are eligible and will accept reserve corps commissions with a view to their assignment in time of emergency to the procurement of the commodity in which they are specialists. It is purposed that upon these men reliance will be placed in time of peace for advice and assistance in the study of industrial facilities and that in time of war they will be assigned to the centers of industry or to Washington for procurement duty. (3) The plan further contemplates that a thorough study be made of the facilities of the country to produce the essential and important items of the supply table and to have on file in the Office of the Surgeon General such reports as will enable the immediate placing of contracts in the event of any national emergency.

In this work the Surgeon General realizes that he must rely upon industry itself, and it is hoped to secure definite and complete information from the manufacturers as to aid they can render. It is probable that in an emergency of any magnitude Congress would again establish control of raw materials, labor, transportation and installations, and the Medical Department expects that with the information to be obtained from the study on file it will be in a position to render great assistance to the

firms making medical supplies for the War Department. It can prevent the drafting of skilled labor, the taking of key men; it can assure the supply of material, of coal and of transportation, and thus obviate difficulties in the operation of the plant.

BRITISH ARMY COURSE OF INSTRUCTION

Special courses of instruction for members of the British Army Veterinary Corps at the Veterinary School at Aldershot are provided for in recent regulations. Classes of three months' duration are given for majors and captains. Other officers may attend by permission of the Director General, either for instruction or for work in the laboratories. There are also classes of similar duration for lieutenants on probation, classes of one month for veterinary officers of the Militia, classes of twelve days for veterinary officers of the Territorial Army, and six months' courses to train noncommissioned officers and men of the Veterinary Corps as laboratory attendants.

THE DOPING OF RACE HORSES

The "doping" of race-horses is the subject of a paper by Prof. F. Hendrickx, in the Belgian journal *Annales de Médecine Vétérinaire*. This practice he says has spread from American training stables to those of Europe. Doping is defined as the administration in any manner of drugs capable of provoking an artificial excitation which permits the animal to put forth an effort of such intensity as would be absolutely impossible under normal conditions. The practice is characterized as being "contrary to the rules of honor which alone should prevail in true sport."

Among the medicaments employed the author names heroin, strychnin, caffein, morphin, cocain and atropin. The action of these various drugs is discussed at length. As a means of detection he points out that the alkaloids may be found in the saliva and other discharges of a doped animal soon after administration, and he proposes that any horse whose saliva taken at the time of the race shows such an alkaloid on chemical examination should be considered as doped.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

MONDAY MORNING, AUGUST 28, 1922

General Session

The first session of the fifty-ninth annual meeting of the American Veterinary Medical Association convened at the Planters Hotel, St. Louis, Missouri, at 10:30 o'clock, President A. T. Kinsley presiding.

The invocation was delivered by the Rev. Dr. William Crow, of the Westminster Presbyterian Church, St. Louis.

President Kinsley: Next we will be favored by an address of welcome to this wonderful city in the Mississippi Valley by Mayor Kiel of St. Louis. (Applause.)

Address of Welcome

Mayor Kiel: Mr. Chairman, Ladies and Gentlemen: It is my pleasure to be here with you this morning. This is one part of the official duties of the chief executive that I like, because it enables me to get away from work a little, and then I have the opportunity of greeting and meeting such people as you. St. Louis is noted for its hospitality, and it is always glad to extend this hospitality to those who come within our borders. St. Louis has made considerable progress as a convention city, and we are proud of the fact that the delegates to the conventions come back. We are glad to impress you with the hospitality of St. Louis, because we want you to feel that you are among home people and among good citizenship.

There are many things about St. Louis that I might tell you about, but I am not going to infringe upon your time because I know that you have lots of things to do, and then after you do your work I know you want to play a little, and we have lots of playgrounds around St. Louis. I know that these men folks can find almost anything they want to attract them, and I know the ladies will see many things that will impress them. There was a time when I might have invited you to visit some of the industries of St. Louis that have now been discontinued, but of course you will find lots that will take their places.

When men and women congregate as you have done to exchange thoughts and ideas, you accomplish many good results. Your profession is one that many people think is becoming obsolete. That is not true. Just as much responsibility devolves

upon you today as at any other period in the history of this Nation. More attention is paid today to curing the ills of an animal than there ever was in the past, and it is just as important that you devote your time and your energy to doing that kind of work, because the day will never come when your profession will be obsolete so long as the red blood flows through the veins of the American people. There isn't any one who doesn't admire the dumb animal; there isn't any one who hasn't a kind feeling for the dumb animal.

Today we are paying more attention to a little eruption or a little sore on a horse's back than they did in my boyhood days. I remember when I was a lad, and when I used to drive a horse to pull the heavy dray, if there was a sore shoulder or something the matter with the horse, we would get a little axle grease and rub it over and expect that to cure it. Those days have gone by, because it is necessary for science to take its part in your profession the same as it does in any profession.

Again, we have an admiration and love for house animals. Twenty-five or thirty years ago if a pet dog got sick they would call in the police and shoot the dog. That was the best way to cure his ills. That isn't the case today. We have a little dog around our house, and that dog visits the veterinarian probably three or four times a year. I don't know whether there is anything the matter with the dog, but everybody feels better after he has been down there.

It is just as important to have your profession as it is to have any other profession or commercial business, because you meet a need of the community and are a necessity.

I know that the results of this convention will mean very much to you, because you can absorb knowledge from one another that you can't get out of a book. When people get together and discuss questions they eliminate friction. Here we are today right in the midst of a crisis—the railroad strike and the coal miners' strike—that has disorganized the entire Nation. Everybody, the innocent as well as the guilty, is suffering as a consequence of that difference of opinion, and a difference of opinion is all it is. There never was a problem so great that men couldn't get their heads together and settle it. There never will be a problem that can't be settled that way. We hoped that it could have been done three or four months ago, before the friction occurred, before this controversy originated. If men had yielded, if they had been in a reasonable attitude, the same thing could have been adjusted four months ago that will be adjusted within the next two or three weeks, possibly in a shorter time, because of the conditions of the country. The people who are dependent upon these commodities can't exist unless that difference of opinion is eradicated.

By this method of meeting here together, many of you

strangers, you become friends, you become acquaintances, you go away after having obtained knowledge that you couldn't get otherwise, and I congratulate you for being here.

I am glad you selected St. Louis for your meeting place. You have made no mistake. We are right in the heart of the Mississippi Valley. We are proud of our city. We like it. A great deal of civic pride will be found in St. Louis because everyone feels that he is a part of the big plan, a part of that machinery that makes things worth while.

We have many interesting places in St. Louis. I know you will spend a very interesting hour or two at our Zoological Gardens, where you will find every species of wild animal. This is an institution established by the people of St. Louis themselves. They impose upon themselves a tax of two cents upon every hundred dollars for the purpose of maintaining these Zoological Gardens. You will find some chimpanzees out there. One is named after me. I said after I was through being mayor I hoped he would succeed me, because he is a very bright young fellow. I want you to see him. The $200,000 that we spend there is well spent and enlightens the children and a lot of the older folks.

We also have the Municipal Theater in Forest Park. I am sorry you were not here thirty days ago. You would have observed one of the greatest productions ever placed upon the American stage. Community work. It isn't a commercial proposition; it is simply the getting together of a lot of talent of St. Louis people, and then the audiences come and witness the efforts and the good work of that talent, which played to more than half a million people last year.

I want you to know that you are here as our guests, the guests of the city of St. Louis. We want to make it pleasant for you; we want to extend you every courtesy; we want to send you home feeling satisfied that you came and with a desire in your hearts to come to St. Louis again. We are always glad to have you, and you are just as welcome as the flowers in May. (Applause.)

PRESIDENT KINSLEY: I am certain that I voice the sentiment of the entire assemblage when I say that we appreciate the remarks of Mayor Kiel. He who responds to the welcome address needs no formal introduction to this organization—Dr. Tait Butler. (Applause.)

RESPONSE TO ADDRESS OF WELCOME

DR. TAIT BUTLER (Memphis, Tenn.): Mr. President, Ladies and Gentlemen—and to you, *our* Mayor Kiel, for we are all loyal St. Louisians this morning—you who have so graciously and cordially welcomed our organization this morning, let me express as fervently as I can our most sincere thanks. The cordial greeting we have received from all assures us that our stay within

this city and our meeting here will be as pleasant and profitable as you have so generously wished.

But, my dear Mayor, this is no ordinary body of men and women that you have so hospitably taken into your home this morning, and this is no ordinary Association in its past record of service. This Association has passed beyond the youthful or formative stage and has achieved a splendid record of progress and service. For, gray as is my head, I am less than a year older than this Association, this being its fifty-ninth annual meeting.

At first its membership was confined to a few stalwart pioneers in the then young American veterinary profession, located in those cities near the Atlantic seaboard, New York, Boston and Philadelphia. The membership grew but slowly for many years and the territorial range of its influence was restricted to the Northeastern States. Even after 25 years, in 1887, when your humble servant became a member, only a scattering few west of the Allegheny Mountains had broken into the rather "close corporation" which up to that time had been maintained. In 1884 the first meeting (two meetings a year were then held) was held outside of New York, Boston and Philadelphia, in Cincinnati, Ohio. But not until 1890, or 32 years ago, and 27 years after the organization of the Association, was the conservatism of the organization broken down by a persistent effort on the part of a few western members and the meeting of that year secured for Chicago. That meeting really marks the beginning of the Association's national and international character and activities. Since then its membership has grown rapidly, gathered from all parts of the United States and Canada. And the range of its territorial influence is indicated by meetings held in Toronto and Ottawa on the north, New Orleans at the south, and in all the larger cities from New York on the Atlantic to San Francisco on the shores of the Pacific.

But I must not reminisce, for that is a sure sign and one of the weaknesses of advancing years, and none are old this morning. This morning, under your cheering words and genial radiance of hospitality, all are young, and this Association has renewed and added to its giant strength and dedicated its powers to a better and larger service with all the enthusiasm and irresistibility of youth.

But let me state that today you have welcomed the largest and probably the most influential organization of veterinarians the world has ever seen, the greatest any other Executive ever welcomed to his city.

Not alone in its splendid history of progress in service and scientific growth is this Association noteworthy. Its members, individually and collectively, and privately and officially, guard the health of 250 millions of farm animals and conserve thereby a property value which reaches around the incomprehensible amount of ten billion dollars.

But I am dealing in material things in such remarks, and I wish, therefore, to also call your attention, as modestly as I may, to the fact that the membership of this organization are also in no small or unimportant way the conservators of the health of all the 125 millions of people of the United States and Canada, in so far as affected by livestock and the consumption of livestock products. By the control of animal diseases, some of which are communicable to man, by the inspection of meat, dairy and other livestock products, not alone do veterinarians conserve the material wealth of these nations, but they also protect the health of every man, woman and child within the broad bounds of this North American continent, yea, and also of those of other countries, who are consuming our livestock products in increasing quantities.

But in conclusion permit me to state again that we accept your proffered hospitality of the great and splendid city of St. Louis, with humility and grateful appreciation. We are not unmindful of the material and historical greatness of the State and this magnificent metropolis. This State and city have given our profession and this Association many esteemed members who have served their State and their Nation valiantly for many years. We have read and committed to memory all of the hundred or more claims this city makes, I have no doubt accurately, to be or have "the largest in the world," including the largest horse and mule market, in which we are vitally interested; "the largest fur market," in which we are not interested just at this time; "the largest (bird) cage in the world" and the largest blow (pipe) factory in the United States.

To you, Sir, personally and as the Mayor of this great city, who have left your executive duties to come here to bid us welcome, and through you to the veterinarians and other citizens of St. Louis, we wish sincerely to tender our thanks for the splendid welcome you have given us this morning. We know we are going to have a good time while here, and we wish you and those you represent the fullest measure of the very best that this life affords.

PRESIDENT'S ADDRESS

President Kinsley delivered his address. It was published in the JOURNAL for September, 1922, page 596.

After announcements the meeting adjourned.

MONDAY AFTERNOON, AUGUST 28, 1922

GENERAL SESSION

The meeting was called to order at 1:35 p. m. by President Kinsley.

APPROVAL OF MINUTES

PRESIDENT KINSLEY: The first business is the presentation and adoption of the minutes of our last annual meeting.

SECRETARY MAYO: I herewith present a stenographic report of the proceedings as published in the official journal of the Association and recommend they be accepted.

(The motion was seconded and carried.)

REPORT OF EXECUTIVE BOARD

PRESIDENT KINSLEY: The next order of business is the report of the Executive Board.

DR. CASSIUS WAY (New York City): It is with a great deal of regret that the Executive Board have to report that Dr. Hilton is unable to be with us at this meeting on account of impaired health. The members of the Board have done me the especial honor and the compliment of asking that I serve as chairman for this meeting. We will endeavor to report to you from time to time the activities of the Board and present matters which should come before the Association for consideration.

It is a great misfortune to all of us that Dr. Hilton is unable to be with us. I recommend that this Association, through its Secretary, send a telegram to him extending the best wishes of the Association and the hope for a speedy and rapid recovery of his health.

From time to time there have been presented names of veterinarians from foreign countries for membership in this Association. At a meeting of the Executive Board in December in Chicago, the Secretary was instructed to secure data, catalogs, requirements for admission and requirements for graduation from various European and foreign schools. The reports that the Secretary has received have been considered by the Association with a recommendation that this matter be referred to the Committee on Intelligence and Education, and that they compile or assemble for the Association such data as will be necessary in reference to making recommendation of schools whose graduates may be eligible for membership in the Association.

There are some 150 or 160 applications for membership up to the present time. These will be presented by the Secretary.

DR. C. P. FITCH (St. Paul, Minn.): I think that some action by the Association should be taken in regard to the report, especially in relation to Dr. Hilton, and I therefore move that the Secretary be instructed to compile a telegram to Dr. Hilton expressing the views as given in the report.

ELECTION OF NEW MEMBERS

(The motion was seconded and carried.)

PRESIDENT KINSLEY: The next order of business is the election of new members.

SECRETARY MAYO: The following applications have been favorably recomended by the Executive Board:

J. E. Aghion, Sakha, Egypt.
A. L. Alton, Manitoba, Canada.
Mostre Arangoy, Havana, Cuba.
C. D. Arias, Marianao, Cuba.
W. E. Armstrong, Cumberland, England.
J. S. Barbee, Kansas City, Mo.
Edw. V. Beaumont, Kansas City, Mo.
J. S. Bengston, Chicago, Ill.
H. E. Biester, Champaign, Ill.
L. Bilikam, Tacoma, Wash.
H. J. Bird, Centerburg, Ohio.
J. A. Bogue, Lawrence, Kans.
R. R. Bolton, Burlington, Vt.
T. O. Booth, Oklahoma, Okla.
C. Bricault, Haverhill, Mass.
G. A. Clark, Toronto, Canada.
G. W. Clark, Yakima, Wash.
J. E. Cloud, San Diego, Calif.
I. M. Cashell, Leesburg, Va.
B. W. Coons, Lisbon, N. Dak.
T. M. Cockery, Argenta, Ill.
A. B. Crawford, Bethesda, Md.
C. I. Crawford, Overbrook, Kans.
D. W. Curtis, Breckenridge, Mich.
B. C. Davis, Carrollton, Mo.
H. B. Davis, Hartford, Conn.
C. F. DeLap, Springfield, Tenn.
D. E. Dufresne. Quebec, Canada.
H. C. Edewaard, Holland, Mich.
W. H. Erwin, Howell, Mich.
F. Etchegoyhen, Havana, Cuba.
R. W. Falk, Canton, S. Dak.
R. W. Finley, Rockford, Ill.
E. E. Flory, Aberdeen, S. Dak.
Harry J. Fry, Kalona, Iowa.
I. C. Gladish, Carlisle, Pa.
A. J. Gregg, Salina, Mich.
F. Hare, Nevada, Mo.
F. R. Harsch, Brownsville, Tex.
C. E. Hart, Kansas City, Mo.
A. Henriquez, Pinar del Rio, Cuba.
A. A. Hermann, Denver, Colo.
F. P. Hust, Jeersonville, N. Y.
A. C. Iduali, Havana, Cuba.
G. E. Jacobi, Ames, Iowa.
E. F. Jardine, British West Indies.
E. C. Jesperson, Ionia, Mich.
H. R. Kleinschmidt, Merrill, Wis.
L. L. Langland, Cambridge, Iowa.
J. B. Lentz, Amherst, Mass.
G. W. Lobach, Easton, Pa.
F. W. Lupfer, Galva, Ill.

J. H. Lynch, Fonda, Iowa.
H. M. McConnell, Independence, Mo.
J. P. McDonough, Richmond, Va.
J. T. McGraun, Trenton, N. J.
K. G. McKay, Colville, Wash.
A. Maurique, Mexico, D. F.
H. E. March, Cooperstown, N. Y.
F. H. Melvin, Kansas City, Mo.
A. K. Merriman, Williamsville, Ill.
John J. Mitchell, Lansing, Mich.
J. P. Mockford, Greenville, Tex.
Jos. C. Nullineaux, Hagerstown, Md.
C. C. Nickel, Nowata, Okla.
J. P. Niederauer, Pierre, S. Dak.
V. P. Norton, Wisconsin Rapids, Wis.
L. T. Oberheim, Elizabeth, Ill.
Z. A. Oviatt, Hubbard, Iowa.
I. W. Perry, Warren, Ill.
L. H. Phipps, Winnebago, Minn.
Jose del Pozo, Mexico, D. F.
H. A. Renor, Kearney, Nebr.
J. P. Rimstidt, Howell, Mich.
F. F. Saint, Calgary, Canada.
J. E. Sargeant, Fairbury, Ill.
J. W. Scheibler, Jr., Memphis, Tenn.
A. F. Schrage, Plymouth, Wis.
R. E. Simonsen, Marcus, Iowa.
R. W. Smith, Concord, N. H.
W. A. Smith, Sparland, Ill.
J. R. Sperry, Schofield Barracks, Honolulu, Hawaii.
F. L. Stevens, Portland, Me.
J. Stokes, Elmhurst, Ill.
G. E. Stanley, De Soto, Nebr.
John W. Taylor, Roodhouse, Ill.
L. W. Thiele, Galien, Mich.
E. G. Thorn, Kenosha, Wis.
G. W. Thurber, Loyal, Wis.
Harry Ticehurst, Tenafly, N. J.
George W. Todd, Fort Dodge, Iowa.
W. S. Tomlinson, Galesburg, Ill.
W. E. Turner, Lincoln, Ill.
C. F. Tuthill, Onsted, Mich.
C. C. Wang, Nanking, China.
Earl S. Warner, Canada, Ontario.
C. H. Wright, Jackson, Tenn.
R. P. Wiese, Carretson, S. Dak.
Henry Wild, Hartland, Wis.
H. F. Wilkins, Lewistown, Mont.
George B. Winch, George, Iowa.
R. S. Youmans, Lawrence, Mass.
W. B. Wise, Sheffield, Ill.
C. B. Weagley, Middletown, Md.
F. C. Shake, Hutsonville, Ill.
O. B. Gray, Williamsfield, Ill.
F. R. Smith, Kansas City, Kans.
H. Adams, Bellows Falls, Vt.
R. O. Biltz, Georgetown, Del.
J. A. McCampbell, Williamsfield, Ill.
G. M. Dorman, Sioux City, Iowa.
A. C. Etchison, Assumption, Ill.
H. A. Gastfield, Deerfield, Ill.

J. Patterson, Hedrick, Iowa.
A. H. Quin, Cedar Rapids, Iowa.
J. E. Warner, Waco, Tex.
A. K. Monroe.
T. W. Bowman.
W. D. Price.
W. F. McDougall.
C. W. J. Haworth, Camrose, Alberta, Canada.

On motion of Dr. E. P. Flower, Baton Rouge, La., seconded, the persons above named were elected to membership in the Association.

SECRETARY MAYO: With reference to the application of Charlie Mangrecock, of Haverhill, Mass., a graduate the Ecole de Médecine de Montreal in 1891, the Executive Board recommends that the rules be suspended and that he be elected to membership. This school was never recognized by the American Veterinary Association and is not in existence now. I would say that incidentally there are some very complimentary things regarding the doctor and his training.

DR. J. A. KIERNAN (Washington, D. C.): I move that the rules be suspended and that he be elected to membership in the Association.

(The motion was seconded and carried.)

MESSAGES OF GREETING

SECRETARY MAYO: I have a letter from Dr. W. H. Dalrymple of Baton Rouge, La., that I was requested by the Board to present. It is a personal letter that you will doubtless be interested in.

(Secretary Mayo read the letter.)

DR. KIERNAN: It is a matter of very deep regret that we learn that sickness has laid its heavy hand upon one of our most pre-eminent members, an Ex-President of this Association. We are all his friends, and everybody in the Association misses his congenial companionship. As a mark of respect to our Ex-President, I move that the Secretary be requested to send a telegram of good cheer to Dr. Dalrymple and ask that he come to the next meeting.

(The motion was seconded and carried unanimously.)

SECRETARY MAYO: I have one or two other messages that I will read.

"Havana, Cuba, August 28, 1922.

"Most cordial greetings and best success to your convention.

"B. J. CRESPO,

"Cuban National Association."

I suppose that most of you know that Dr. and Mrs. Blattenberg are the proud parents of a little daughter a few months old. (Applause.) This is from Dr. Blattenberg:

"Best wishes for most pleasant and profitable meeting. Unable to come. Wash out on line." (Laughter.)

PRESIDENT KINSLEY: Do you care to take any action regarding either of these telegrams?

Dr. E. L. QUITMAN (Chicago, Ill.): I move that a telegram from this Association be sent to the young lady congratulating her on accruing to such nice parents, as I know personally she has accrued.

(The motion was seconded and carried.)

REPORT OF EDITOR

PRESIDENT KINSLEY: We are ready for the report of our Editor, Dr. J. R. Mohler.

(Dr. Mohler presented his report as Editor, as follows:)

Report of the Editor of the Journal to the Executive Board

Volumes 13 and 14 (new series) of the JOURNAL, covering the year from October, 1921, to September, 1922, contained a total of 1,396 pages of reading matter, a monthly average of 116 pages. The contents comprised 101 papers on a wide range of subjects, 36 clinical and case reports, 80 abstracts of research papers (practically all foreign), 8 book reviews, 107 reports and notices of meetings of veterinary associations and other gatherings, 35 editorials, and numerous miscellaneous articles and items.

Although the quantity of material relating to general practice has been well maintained as compared with previous years, and we have made every effort to bring about a further increase, I feel that we are still not covering this field adequately. It is very difficult to get a good supply of papers and reports on subjects relating to practice. The research worker appreciates the importance of placing his results on record and is a fertile source of contributions to veterinary literature. The educator, too, as a rule is a ready writer. The veterinarian in the public service understands the value of the printed page as an aid to the efficiency of his work. But the practitioner, the most numerous class of all, is not given to much writing. He is anxious to read what others have written that will help him in his professional work, but he does not always realize that he can render a reciprocal service by putting into print the results of his experiences that may be helpful to others. If practitioners could be induced to furnish fragmentary notes on their cases or methods of practice, jotted down on a piece of note paper, little effort would be required and much benefit would result.

Our department of Clinical and Case Reports is intended to cater especially to the practitioners. It is for them to supply the bulk of the material. Special articles on problems of practice are also invited. Our Resident State Secretaries and the secretaries of State and local associations can assist greatly in increasing the supply of such papers and reports. Some of them are already doing this, and their cooperation is greatly appreciated.

With a view to stimulating a larger supply of material of a practical character I venture to repeat a suggestion made in my report to the Executive Board a year ago, but which was not acted upon. It is that small prizes be offered for brief essays on certain subjects which are announced in advance. Some disease or ailment of general interest should be chosen as a subject and announced, with an invitation for brief articles (not exceeding, say, 500 words) to be submited by a certain date (at least three months ahead),

cash prizes to be awarded to the best three, the prize-winning articles to be published. Prizes of $15, $10 and $5 are suggested, and the Subcommittee on JOURNAL should make the awards. The papers should present effective methods of treatment rather than describe diseases. I trust that this plan may be approved and put into operation.

Our deparment devoted to the Army Veterinary Service has dwindled to small proportions in recent months. Our confrères in the military service are invited to support this department with contributions of interest in their particular field.

In other respects the contents of the JOURNAL have been satisfactory in volume and of good quality on the whole. Several papers of outstanding excellence were published. The increasing extent to which our original articles are reprinted or abstracted in foreign journals is an undoubted influence in raising the standing of the American veterinary profession in the eyes of the scientific world.

Our acknowledgments and thanks are hereby tendered to all our collaborators who have furnished valuable assitance in making the JOURNAL a success.

The following comparison may be of interest in reference to the income received by the JOURNAL. From September 1, 1920, to August 31, 1921, the collections were $7,757.82 for advertising and $2,111.53 for subscriptions, or a total of $9,869.35. From September 1, 1921, to August 25, 1922, with similar rates obtaining for advertising and subscriptions, the JOURNAL received $8,317.16 for advertisements and $2,325.61 for subscriptions, or a total of $10,642.77. This shows an increase of $559.34 in collections for advertisements and $214.08 for subscriptions.

Dr. Jacob, our Treasurer, advises me that he has received this year from Secretary Mayo and myself for the JOURNAL account $21,728.90, as compared with $21,372.15 for last year and $12,748.24 for 1920.

Although the expense for advertising is being closely watched by advertisers, the JOURNAL has noted with gratification that most of the bills for this service are paid promptly, showing that business conditions are improving, which should be reflected in the veterinary profession.

All my records, bank book, check book, letter files, duplicate deposit slips, monthly statements from the bank, quarterly statements to the Executive Board, etc., were turned over to a qualified acountant for review, and his certificate of examination and audit is attached for your information.

J. R. MOHLER, *Editor.*

(Applause.)

PRESIDENT KINSLEY: You have heard Dr. Mohler's report, a complete, comprehensive report. What is your pleasure?

DR. QUITMAN: I move that it be accepted.

(The motion was seconded and carried.)

REPORT OF SECRETARY

PRESIDENT KINSLEY: The next order of business is the report of the Secretary, Dr. Mayo.

(Secretary Mayo read his report, as follows:)

It is gratifying to report a gradual increase in membership, although members alone are not the measure of progress. It is the active interest of all the members and constructive work that counts.

There are about 4,185 members on the rolls at present. Seventy-one former members who had dropped from the Association have

been re-instated. Twenty-one members have died. Eight have resigned. There are about one hundred and seventy applications for membership.

I wish particularly to call your attention to the fact that a number of applications are being received from veterinarians in foreign countries and a recent letter from the Secretary of the Australian Veterinary Association stated that the American Veterinary Medical Association was considered the leading Veterinary Association in the world. We now have active members scattered all over the world. The extension of the influence of our association in foreign countries should be encouraged. I would recommend that a special committee be appointed to consider and report upon this subject at the next meeting.

The Special Committee on Membership composed of President Kinsley, Editor Mohler and the Secretary in making plans for getting new members also considered the matter of reinstating members who had been compelled to drop out during the war or for financial reasons. It was decided by the committee that a special dispensation should be made and that members who were warriors and who would have been dropped for non-payment of dues could be reinstated upon the payment of $5.00. The recommendation of the Committee on Membership was approved by the Executive Board as it was felt that it would be a very desirable plan in every way. As a result of this action more than 150 delinquent members have been reinstated, a number of them writing letters of thanks for the opportunity given them.

I would recommend that the By-Laws be changed so as to permit the Executive Board to make special arrangement for reinstatement of members who are back in their dues and also to provide for a few cases where members do not require the JOURNAL. Cases are frequently occurring where the Association is likely to lose members on account of some complication. This would be a practical arrangement for the Association in every way, and the following amendment to Article 7 of the By-Laws is proposed:

"Section 3.—The Executive Board may in exceptional cases make special arrangement for reinstatement and remission of dues."

Some years ago our Association had an Honor Roll. Those who had been active members of the Association for 25 years were placed on this Honor Roll and were not required to pay any dues. This condition prevailed before the Association published an Official JOURNAL. Later, at the time of the adoption of the present Constitution and By-Laws, the Honor Roll was eliminated, and all were placed on the same basis.

A number of the older members thought that this was not right and have dropped their membership in the Association. Whether it is desirable to make some sort of provision for these long time members, is for you to decide.

The expense of the Secretary's office for the past year may be classified as follows:

Printing and stationery	$908.10
Clerical help	835.81
Postage	355.18
Office supplies	5.05
Incidentals	4.18
Telegrams	32.21
Reporting Denver meeting	602.70
Traveling expenses	273.03
Emblems	429.75
Auditing Secretary's books	25.00
Buttons for St. Louis meeting	19.80

There is no question that the veterinary profession does not receive the publicity that it should, particularly with reference to the interests of the practitioner. At the present time campaigns of publicity are being carried out by various interests and a certain amount of time is often advertised to be dedicated to certain topics of interest to the public. The campaign of publicity for preserving the teeth has undoubtedly done a great deal of real good, so far as the public is concerned, and incidentally has brought the dental profession deserved publicity. Campaigns for purebred livestock have been successfully carried out. It has been a benefit for not only the average farmer and stockman, but also to the breeder of purebred stock. Could not a campaign for healthier livestock be carried out in cooperation with the breeders of the country? This would not only help the movement that is on foot to control tuberculosis and other transmissible diseases, but should include all diseases of animals, those that are due to faulty diet and lack of proper care. It is possible that some judicious advertising in some of the leading agricultural and livestock papers of the country might be of great benefit, not only to the livestock industry, but to our profession as well.

I would recommend that a committee be appointed to consider this question, particularly with a view to cooperating with the various Breeders Associations.

It is evident to all that the lines of demarcation that have existed between veterinary and human medicine are disappearing. The American Veterinary Medical Association, as representing the veterinary profession in America is being called upon more and more to take an active part in solving problems that effect medical science as a whole and also various scientific organizations whose work has a bearing on medicine—both the human and comparative.

The American Veterinary Medical Association should take an active part in all measures looking to a closer cooperation with those agencies working for the preservation of life, both human and animal, and I would recommend that a committee be appointed to prepare some plan for cooperation service between the A. V. M. A. and human medical and sanitary associations.

Some four years ago I recommended to the Association in my annual report that closer cooperation between the A. V. M. A. and State and local associations should be given special consideration and a committee was appointed. This committee presented an excellent report at the Columbus meeting, but they did not think the conditions warranted the adoption of a plan similar to that of the American Medical Association. During the past year this matter has again been presented to the Executive Board and President Kinsley has appointed a special committee that will report at this meeting. There is need of some definite organization in each State and Province to represent and look after the interest of the National Association. At present the only representation is the Resident Secretary and these are frequently changed.

At the last meeting of the Association an official automobile emblem was adopted. The price fixed by the Executive Board for this emblem was $1.25, postage paid. Five hundred seventy-three were purchased in the first order and about four hundred have been sold. This emblem is a very attractive one, and the price is very reasonable. Several orders have been received from non-members, but these orders have been returned.

The question of changing the date for the annual meeting of this Association has been raised by a number of members. At the present time the meeting comes at a period when many practitioners in the Central West are busy vaccinating hogs, and it is a period in their practice that they can not afford to neglect.

In addition to this, another objection that has been raised is whether the last of August is likely to be uncomfortably warm. Some members have suggested it would be more satisfactory to have the annual meeting the latter part of June. This is presented for your consideration.

In the past few years there have been a good many suggestions made to the Secretary by members of the Association, that programs should be made as practical as possible, and quite a good many have urged that a clinic be provided for.

This year, owing to the favorable location, it has been decided to see if it was practical to have a rather elaborate clinic. You will all recognize the difficulties in presenting a clinic where the attendance is so large, as it makes it difficult for but a few members to get any real value from the clinic. These problems have been considered by those in charge of the clinic, and it has been the endeavor to present a clinic in such a way that practically all those who attend can get the benefit of it.

On the other hand, some members have expressed the opinion that clinics and practical demonstrations are more properly within the sphere of local and State associations, and that the National Association meeting program should be made up largely of presentation and discussion of more general problems, that affect the profession as a whole, not only in America, but in other countries as well.

There is no question but what the program should include not only the latest scientific researches and also discussion of practical problems, and as a rule an endeavor has been made to present a well-balanced program along these lines.

This year an effort has been made to present a program in which clinics and practical problems predominate. With these facts and with the results of the present program before you, an expression of the opinion by the Association as the general plan to be followed for future programs, would be of great value to those upon whom the responsibility for program rests. It has been the earnest effort to present a program that will meet the needs and approval of a majority of the members of the Association.

I have notified the Executive Board that because of the pressure of other duties, I wish to retire as your Secretary. In severing my official connection, you will pardon me if I review briefly some phases of the progress of the Association during the past ten years.

The Association membership has increased from 1,800 to 4,100. Ten years ago the income of the Association just paid the running expenses. Now the Association has a reserve fund of more than $30,000.

Upon my recommendation, an official monthly journal was established that has proven a powerful factor in promoting the interests of the Association and our profession in this and other countries.

The influence of the American Veterinary Medical Association has increased greatly, not only in America, but in foreign countries, and I believe the A. V. M. A. is recognized as being the leading veterinary association in the world.

Some four years ago I presented, and the Association adopted a motion to combine the offices of Editor and Secretary and establish a fixed office where all the business activities of the Association should be centered. I am firmly of the opinion that no more progressive step can be taken at the present time. The need of a permanent centrally located office for carrying on the routine business of the Association is greater than ever before and should be put into effect at once.

The American Veterinary Medical Association has been one of my pet hobbies, and I have endeavored to promote the interests of the Association in every way possible in the thirty years I have

been a member, six years of which I have had the pleasure and honor of serving as your Secretary. I am proud to have had the opportunity of doing some constructive work for our Association and profession, and I shall always be ready to do anything in my power to help to make the A. V. M. A. bigger, better and more useful.

I wish to express my appreciation for the hearty cooperation and support to all the officers, committees and individual members, particularly to President Kinsley, who has worked so hard to make the work the past year and this meeting successful. I also take this opportunity to publicly express my thanks for the faithful and efficient services of my Secretary, Miss Apeland, who has done all the routine work of the Secretary's office.

N. S. MAYO.

PRESIDENT KINSLEY: What is your pleasure with the Secretary's report?

SECRETARY MAYO: It is customary to receive it and refer it to the Executive Board for consideration.

DR. A. H. BAKER (Chicago, Ill.): I move it be received and referred to the Executive Board.

(The motion was seconded and carried.)

DISCUSSION OF SECRETARY'S REPORT

DR. HAMLET MOORE (New Orleans, La.): There are several things in Dr. Mayo's report that call for considerable discussion. There is a roll of honor, and a man that had been in this Association twenty-five years was placed on the roll of honor, and then because the JOURNAL was included in the fee he was taken off that honor roll. Now to be born with a silver spoon in your mouth —and every one of the gentlemen might have been (I wasn't)— and have it yanked out is a pretty tough proposition. It seems to me that there ought to be some provision made whereby the men that have been placed on the honor roll could be placed on there with the fee for the JOURNAL subscribed.

PRESIDENT KINSLEY: There is no honor roll now.

DR. MOORE: I realize that, but it was abandoned because the JOURNAL was included in the fee. If you have been working for twenty-five years, honestly, intelligently and energetically, and the reward has been given you and then taken away, you wouldn't appreciate it very much. Do you remember how many members we had on that honor roll?

SECRETARY MAYO: I can't tell you offhand, but I think there is a matter that will be referred to the meeting in regard to changing the Constitution and By-Laws with reference to giving the Executive Board authority to provide for these few cases in another place. A majority of these old members prefer to be considered active members and go on. I see half a dozen here who don't want to be put on the honor list. There are a few, however (I don't believe over a half a dozen), that are hurt. They are old stand-bys that have been members of this Association for many years, and their feelings were hurt when the Constitution and By-Laws were changed, and they were put

back after being carried for some years on the honor roll, and they have dropped out of the Association. A little later I have a matter coming up that almost bears on this.

DR. MOORE: It was in the behalf of the few that had dropped their membership that I asked this question, and I don't think that this Association can afford to have a man drop his membership for a thing of that kind. It isn't a question of their being placed actively on the list; it is an honor to be on that honor roll; that is why it was termed an honor roll. It isn't a question of a few dollars that is really donated to them or they are spared from paying, and I believe there should be a provision whereby the members that have been dropped should be appealed to to restore their membership in this organization as members of the honor roll.

The emblem was mentioned in the report. The emblem is the national and authorized emblem of the Association, and I don't see where any nonmember should have an emblem of a recognized association if he is not a member. I think by all means that has been the proper course.

SECRETARY MAYO: This report will be referred to the Executive Board, and I think they will formulate recommendations on all the recommendations that I have made, and they will be presented separately to the association later on for their consideration, so there will be an opportunity to discuss them.

REPORT OF TREASURER

PRESIDENT KINSLEY: The next order of business is the report of the Treasurer, Dr. M. Jacob.

DR. M. JACOB (Knoxville, Tenn.): As is the usual custom, the Treasurer's report has been prepared in pamphlet form and has been distributed to the seats so that it will become available to all of you. I wish, however, to supplement the written report with a few remarks in order to bring out some points with reference to the financing of the Association which might be of interest to you.

The balance on August 4, 1922, was $33,313.68. The balance on August 4, 1921, was $27,341.36, showing a net gain for the year of $5,972.32. Of this balance, $470.56 applies to the Association Fund, $53.33 to the Relief Fund, $5,448.43 to the JOURNAL Fund. The total amount of interest collected during the past year was $1,222.49, showing a net gain other than from interest of $4,749.83.

As to our bond holding and par value, we have $27,000 worth of bonds, which cost $25,886.10.

Now as to some comparison regarding the gains of the different funds. For the year ending August 4, 1921, the Association Fund showed a gain of $47.31. On August 4, 1922, it showed a gain of $470.56 for the year. The Relief Fund on August 4,

1921, was $18.68. The gain for the past year was $53.33. For the JOURNAL Fund our gain for the year ending August 4, 1921, was $912.37, while our gain for the year ending August 4, 1922, was $5,448.43. This, I think, is an elegant showing for the management of the JOURNAL.

I believe the report shows very clearly that our financial status at the present time is very much healthier than it was a year ago. (Applause.)

(The Treasurer's formal report will be printed later.)

DR. H. P. HOSKINS (Detroit, Mich.): I move that the Treasurer's report be accepted and referred to the Audit Committee.

(The motion was seconded and carried.)

REPORTS OF COMMITTEES

PRESIDENT KINSLEY: The next order of business is the report of the Salmon Memorial Committee. I understand that committee is not yet ready to report. Following that is the report of the Special Committee on Closer Affiliation with State and Local Associations. If that committee is not ready I will call for the report of the Committee on Badge.

REPORT OF COMMITTEE ON BADGE

SECRETARY MAYO: Your Committee on Badge recommends that an official A. V. M. A. badge or button be adopted. Second, we recommend a design somewhat similar to the official automobile emblem—a crimson center with caduceus and superimposed "V" in gold. Surrounding the crimson center a white circular ring bearing in gold letters the words "American Veterinary Medical Association." A sketch of design is herewith submitted. If desired this design could be embossed on stationery.

DR. QUITMAN: Before moving the adoption of that report I want to comment on the diagram of that button. I believe it said it was to be in gold, did it not? That is in keeping with the automobile emblem, is it not?

SECRETARY MAYO: It is a little different from the automobile emblem in that there is a wider band of white around the crimson center, and in this band of white is put the caduceus with the superimposed "V."

DR. QUITMAN: I want to suggest that that "V" be enameled in some color, preferably white, because in gold in the same color as it is on the automobile emblem, after it turns a little bit, no one can make out that "V" unless he gets right down to it and studies it. I have been contemplating seriously taking my emblem off my machine because no one can see the letter "V," and they take it for a medical emblem, and I never cared to sail under false colors. That same change should also be made on the automobile emblem. That "V" should be in a color, pref-

erably, I think, white, because just as soon as it turns it is hard to pick out the "V" even when you know it is there.

PRESIDENT KINSLEY: Do you make that as a motion?

DR. QUITMAN: I move that we adopt Dr. Mayo's recommendation, and that the "V" be enameled in white.

SECRETARY MAYO: I don't know whether that can be done. There is a question of manufacture there that I couldn't decide.

DR. QUITMAN: It can be done because you have enameling on the bottom.

PRESIDENT KINSLEY: I should like to ask the Secretary, if this motion prevails, if it carries with it that the Secretary provide these emblems.

SECRETARY MAYO: No, it doesn't. This is just the report of the committee that was appointed to consider an emblem for a button for the Association, an official button or badge.

PRESIDENT KINSLEY: Dr. Quitman has moved, and it has been duly seconded, that this report be received and that the "V" on the emblem be enameled in white. It would seem that there is no instruction in obtaining these emblems, but that is the motion before the house.

DR. JOHN EAGLE: I don't see why that "V" should be changed. We had an emblem with a "V" and it showed up very nicely. I think if we put a white one there that it would simply bring out the "V." I don't think that would be right. This is the A. V. M. A. It is uniform and I don't see why you should want to bring out the "V."

SECRETARY MAYO: There is no inscription on here at all except the "V."

(The motion was put and lost.)

DR. CAHILL: I move that the report be adopted.

(The motion was seconded.)

DR. EAGLE: Dr. Quitman tells me that that emblem tarnishes, and there is no reason why that "V" should tarnish.

SECRETARY MAYO: It depends altogether on what it is made of, whether it will tarnish or not. This is brass, and after the lacquer wears off it will tarnish unless you polish it up. These can be made in gold plate and will cost in quantities about 15 cents each. The gold plate will not tarnish until the gold wears off, and you can get solid gold if you want to.

DR. HAMLET MOORE: How much will these cost in the gold for a button?

SECRETARY MAYO: I couldn't tell you what a gold button would cost, but these gold-plated ones would cost about 15 cents apiece.

DR. MOORE: The life of a gold-plated button would be several years.

(The motion was carried.)

REPORT OF SPECIAL COMMITTEE ON CLOSER AFFILIATION WITH STATE AND PROVINCIAL ASSOCIATIONS

PRESIDENT KINSLEY: The next order of business is one that I consider very important. It has to do with the recommendation on revision of our Constitution. I am very desirous that you get the import of this report. I call for Dr. McLeod, who is chairman of the Committee on Closer Affiliation with State and Local Associations.

(Dr. McLeod read the report, as follows:)

This committee was selected by President Kinsley to study plans suggested for reorganization, submitted to the Executive Board in Chicago. The plans and suggestions were offered by a committee representing the North Central Iowa Veterinary Association, which in brief had for its object the possibility of making the A. V. M. A. a more representative association.

1. It is the unanimous view of this committee that the Constitution and By-Laws be revised in order to assure a just and democratic representation of the members of the profession.

2. We believe that there should be an intimate relation established between this Association and the State and Provincial associations, and that representatives from the State and Provincial associations should constitute the governing body.

3. A number of State associations have voluntarily signified their approval of these plans by resolutions.

4. Therefore, we recommend that a special committee, consisting of the President of the Association and four other members, be immediately appointed to study the details of the plans herewith submitted, in conjunction with the Executive Board, and that this report shall be considered as a written notice to the Association of a proposed revision of the Constitution and By-Laws at the next annual meeting.

5. We further recommend that provision be made for the publication of the Constitution and By-Laws and distribution to each member, and that funds be appropriated to defray the necessary expenses of the committee.

J. H. MCLEOD, *Chairman.*
L. A. MERILLAT, *Secretary.*
CHARLES E. COTTON.

DR. J. H. MCLEOD (Charles City, Iowa): I move the adoption of this report.

DR. COTTON: I second the motion.

DR. F. TORRANCE (Ottawa, Canada): The report of this committee being as brief as it is, it is difficult to understand it, and I would be unwilling to commit the Association to amend the Constitution without understanding it a little further. I would like the President or the chairman of this committee to explain a little more in detail what it is proposed to do.

PRESIDENT KINSLEY: In this committee report the notice is given for the adoption one year hence, and this committee's findings in conjunction with the Executive Board will be published so that every member will have an opportunity of studying this prior to the next annual meeting when it is up for adoption.

DR. TORRANCE: I understand, then, that an affirmative vote does not commit us to adopt this.

PRESIDENT KINSLEY: Absolutely not. We are just accepting this report. Gentlemen, you understand that if this motion is carried you simply adopt the report of this committee, and that a future committee will be appointed to confer with the Executive Board and bring up the proposed revision for adoption one year hence.

(The motion was carried.)

REPORT OF COMMITTEE ON ANATOMICAL NOMENCLATURE

PRESIDENT KINSLEY: We will call for the report of the Committee on Anatomical Nomenclature. The report is in the hands of the Secretary.

(Secretary Mayo read the report of the committee, as follows:)

This report consists of three parts: I. A brief résumé of work done by previous committees. II. A statement of the present situation. III. Recommendations.

I. At the Toronto meeting in 1911 the Association ordered the appointment of a committee to revise our anatomical nomenclature. The duty of this committee was to prepare a uniform and workable terminology to replace the chaotic accumulation of names which had become an unbearable burden to instructors and students and a serious impediment to the interchange of ideas which involved the use of anatomical names. This committee found it necessary first to formulate the general principles which should govern the work of specific revision. The report embodying these principles was received at the Indianapolis meeting in 1912.

The committee was continued and at the New York meeting in 1913 presented a report which included the revised lists of names for the bones, joints, muscles and viscera. This report was received and published in the Proceedings of the year 1913. No expense account was presented by the committee.

The committee continued its labors and in 1914 the chairman forwarded to the Secretary of the Association for presentation at the New Orleans meeting the revised lists of names for the remaining structures. This meeting was not held.

The complete report was in the hands of the Secretary to be submitted at the Oakland meeting in 1915. It was accepted and referred to the Committee on Publication. The report was not published. What appeared in the Proceedings of the A. V. M. A. in the JOURNAL, pp. 636, 637, as the report of the Committee on Anatomical Nomenclature was merely the chairman's letter of transmittal, together with a few terms which were inadvertently omitted from previous lists. Evidently this was all that was actually presented to the Association. Dr. Newsom, a member of the committee, made an effort to have the actual report presented and acted upon, but without success. He gave notice that after its publication, presumably a year hence, a motion for its adoption would be made. Subsequently the chairman endeavored to have the report published, but without success; it had apparently disappeared.

On June 1, 1916, the committee sent to Secretary Haring for presentation at the Detroit meeting a report stating that they had been unable to make any further progress, and explained that they were in no way responsible for this unfortunate situation. The impasse was due to the fact that the terms presented in the preceding report had not been published as ordered by the Association. It is obvious that a matter of this kind can not be intelligently dealt with without publication. The committee therefore recommended that

the (preceding) report be printed and that the committee be continued and authorized to obtain the views of their colleagues in order that the whole matter might be put in final form for submission to the Association. On December 1 the chairman inquired of Secretary Merillat as to the status of the committee and its work. The reply was to the effect that the report apparently was not laid before the Detroit meeting, although it was duly signed and filed with the Secretary for presentation. There was no excuse for the failure to read this report, since it could be done in less than five minutes.

The report of the committee filed with the Secretary for the Kansas City meeting in 1917 quoted in toto the unread and unpublished report of the previous year and repeated the recommendations made therein (JOURNAL OF THE A. V. M. A., Vol. 52, p. 229). The executive board recommended that the Secretary be instructed to multigraph the report of the committee on anatomical nomenclature for distribution among anatomists of the veterinary colleges. This recommendation was adopted.

The new chairman of the committee (Dr. H. S. Murphey) wrote to the present and former chairman that he was unable to obtain the completed list of terms which had been filed by the original committee with the Secretary in 1914; as before stated, it seemed to have disappeared.

At the Philadelphia meeting in 1918 the committee reported little progress, due chiefly to the disappearance of the completed list of terms filed in 1914, and the consequent necessity of preparing another list. A brief history of the work was appended. The committee recommended (1) that the committee be continued; (2) that the provision regarding multigraphing of the report remain in force; (3) that the history of the work of the committee be published with this report. This report was received and the committee continued (JOURNAL OF THE A. V. M. A., November, 1918, and January, 1919, p. 464).

During the succeeding year the chairman prepared a new second list of terms which was almost identical with the list submitted by the original committee in 1914. Multigraph copies of this list were sent out to the veterinary anatomists as a referendum. This list was included in the report of the committee at the New Orleans meeting in 1919. In addition the committee moved (1) the adoption and publication of the terms by the Association, (2) that the committee be continued to prepare and submit a table of suggested English equivalents, together with such additions and corrections as are necessary to conform to the lists of the American Association of Anatomists, and that the Committee be directed to cooperate with the veterinary anatmosists of other English-speaking countries in the preparation of said lists of anatomical terms. The report was signed by three members of the committee. After some discussion, which was apparently due to the unusual action of the committee in including motions in their report instead of the usual procedure of making recommendations, the report was adopted (JOURNAL OF THE A. V. M. A., February, 1920, p. 541).

In spite of the foregoing action of the Association adopting the report, the second list of terms was not published.

At the Columbus meeting in 1920 the then chairman and one member presented a report, stating that the Executive Board had disapproved the adoption of the list of terms submitted and the publication of the list. The report contained two motions: A. That the committee be continued to prepare a table of English equivalents together with additions and corrections, and that the committee be directed to cooperate with the veterinary anatomists of other English-speaking countries. B. That the Latin terms previously submitted be adopted. This report was adopted.

The committee made no report at the Denver meeting in 1921. The present chairman was called upon to make a verbal statement and suggested the continuation of the committee, which was agreed to.

The committee desires to direct attention to some outstanding features of the preceding brief historical review.

1. The original committee of three completed in 1914 the work assigned to them by the Association in 1911. In justice to the other two members, I. E. Newsom and S. L. Stewart, the chairman, as the surviving member, feels that the Association should know that the committee was in no way derelict in its duty, but completed its task in as short a time as the magnitude and inherent difficulties of the work permitted. It involved the sifting of thousands of terms, study of related literature in several languages, and some laboratory investigations to settle controversial points. Furthermore the work of the committee had to be done very largely by correspondence.

2. The first action which effectually blocked the progress of the work was that of the Executive Board, which voted not to carry out the resolution passed by the Association that appropriated $300 for the use of the Committee on Nomenclature to publish its report and send copies to those interested thirty days before the next meeting. In this action the Executive Board undoubtedly arrogated powers which had no sanction in the Constitution or By-laws and thereby defeated the purpose of the Association embodied in the said resolution. The plea of lack of funds was beside the point. It is the business of an Executive Committee promptly to set aside funds specifically appropriated, precisely as a bank does relative to a certified check.

Another serious and unnecessary obstacle to progress consisted in the failure to publish in the Proceedings the report presented at the Oakland meeting. It was, of course, the expectation of the committee that all who were interested would have an opportunity to examine the lists of names and thus be enabled to criticize the work of the committee and vote intelligently upon it.

The statement of the chairman of the Committee on Nomenclature at the Columbus meeting that the Executive Board had disapproved the adoption of the list of terms and the publication of the list is an astounding one to those familiar with correct procedure in such cases.

II. The present situation is briefly as follows:

1. All of the anatomical terms in the lists prepared by the Committee on Nomenclature have been submitted to the anatomical teachers of the various colleges for their consideration.

2. These lists have been twice adopted and ordered published by the Association.

3. The first list, comprising about half of the terms, was published in the Proceedings of the A. V. M. A. for 1913. This list contains printer's and other errors, and omissions. Furthermore it is practically buried from the standpoint of utility. The second list is yet unpublished.

III. In view of the foregoing facts your committee respectfully makes the following recommendations:

1. That the committee be continued and that it be and hereby is authorized to edit the lists of terms in reports previously adopted, to publish said lists of terms as edited in book form, and to prepare for such publication a brief introductory statement.

2. That the Executive Board is hereby directed to conform to the terms of the preceding recommendation.

SEPTIMUS SISSON, *Chairman.*
F. W. CHAMBERLAIN.
MARK FRANCIS.
E. SUNDERVILLE.

DR. CAHILL: I move that the report be accepted and laid on the table.

(The motion was seconded by Dr. Hoskins.)

SECRETARY MAYO: For your information I would say that the list referred to in the report of this committee is in the hands of the Secretary. It is about two inches thick and consists entirely of anatomical names. It would be of interest only to teachers and students of anatomy. I am not criticizing this at all, for I believe this committee has done a splendid work and a very much needed work. I believe a limited edition of this ought to be published. We can't very well publish it in the official JOURNAL of the Association, because it will take up too many pages; it would kill the JOURNAL to attempt to put it in there. I think it would be very proper to publish this in pamphlet form. I don't believe it ought to be published in book form. If anyone wants to have it bound for preservation he could have it bound at his own expense. I do believe the Association should have this committee. I believe they have some further revisions on these anatomical names. I think these names should now be gone over for a final revision by the committee, and there should be a limited number published, and a definite amount should be appropriated for that purpose. We have no idea as to how many should be published. How many will be needed? Five hundred? A copy for each member of the Association? I confess that personally I don't feel qualified to say what should be done. Here is a long report of purely anatomical names that has a value to teachers and students of anatomy. It ought to be in shape for those who want it.

DR. EAGLE: There is only one question, I think, that comes up there. If this report is going to be laid on the table, that is going to kill it forever. The question rolls around in my mind, if this was not an important procedure, why in the world have they allowed it to go on from 1913 up to the present time, and allow these men to go to all the trouble and do all the work that they have done, and then come up here today and lay their work on the table? I think if we were going to kill that work we should have killed it in 1913 and stopped it. These men have put in their time and they have put it in gratis, as I understand it, with very little expense to the Association. If this doesn't do any one else any good but teachers, the work of these men should be appreciated enough to adopt the report and make a few copies of it at least.

DR. QUITMAN: I would like to ask, as a matter of information, inasmuch as Dr. Sisson is the chairman of that committee, does this report of these anatomical names differ materially from Sisson's Anatomy?

SECRETARY MAYO: I don't know.

DR. QUITMAN: I would imagine they would be in keeping with Dr. Sisson's ideas, and perhaps if a comparison were made

there would be no necessity for publishing the report. I have an idea that to adopt that report would be to certify Sisson's Anatomy as an anatomical verbiage for the profession. I fully agree with Dr. Eagle, that it would not be fair nor courteous to this committee to table this report, and I certainly think the Association should at least vote against tabling the report.

DR. C. A. CARY (Auburn, Ala.): I would like to tell the men who made this motion and seconded it to lay this on the table, that that kills it, and it ought to be left for the Association to decide in a separate motion. It is irregular to have a motion to accept and lay on the table in the same motion. It is not permissible by parliamentary usage. I would like to see a motion made to accept this, and then if you want to make a motion to lay it on the table, make that motion.

DR. CAHILL: It isn't my intention to discredit the work of this committee. Far be it from me to belittle their work. But I am anxious, and I think everybody else is anxious, that we don't see our anatomical nomenclature get into chaos—and it will soon be a hopeless chaos if this is going to be allowed to stand. If I am correctly informed—I may not be—this committee's work is not finished. I can see no sense in publishing such a vast amount of material which has no standing at this time until this committee's work is finished. If the majority of the representatives of the schools here say that they need that, I not only would be willing to withdraw my motion to table the report, but I would be pleased to see a limited number of these published if the veterinary schools want that done. My idea was simply to try to prevent this thing being thrown out in the JOURNAL or otherwise published to add to the confusion and chaos.

SECRETARY MAYO: I don't think anyone here is well enough posted on the work of this committee to say really what ought to be done with it. I think that the report of the committee ought to be received and the committee continued, and at the other meeting let them come before us. This is mostly criticism of what has happened before; but let them come before us and show us what the need is, and I feel sure that the Association will do what it thinks is right.

PRESIDENT KINSLEY: I would like to ask Dr. Cahill to amend that motion that we accept the report and the committee be continued.

(Dr. Cahill agreed to this, with the consent of the second. The motion was then put and carried.)

REPORT OF COMMITTEE ON INTERNATIONAL VETERINARY CONGRESS

PRESIDENT KINSLEY: Next I will call for the report of the Committee on International Veterinary Congress. Dr. Mohler is chairman of that committee. I believe Dr. A. Eichhorn is to make the report.

DR. A. EICHHORN: At the request of the committee I have visited various countries and have interviewed quite a number of veterinarians who have been previously interested in international congresses. The impression I have is that at the present time there is hardly an opportunity of organizing a congress and deciding upon a place where such a congress should be held. This condition primarily is due to the political and economic conditions in Europe, and it will take a considerable time before it will be possible to establish normal conditions or such situations which will enable the scientific organizations to get up and deliberate on problems which are of an international character. This condition is unfortunate and is probably primarily due to certain countries not desiring to enter into correspondence with alternative organizations of other countries. For this reason I believe that at the present time it is impossible for this country to issue an invitation to the various countries for the holding of such a congress in the United States. I therefore recommend, in agreement with the committee, that for the present time the idea should be given up until later when we might be in position to invite the veterinary organizations to come to the United States for an international gathering. (Applause.)

DR. V. A. MOORE: I move that the report be received and the committee continued.

(The motion was seconded and carried.)

REPORT REGARDING HORSE ASSOCIATION OF AMERICA

PRESIDENT KINSLEY: Next we will have the report of the representative on the Advisory Board of the Horse Association of America, Dr. G. A. Dick.

DR. G. A. DICK (Philadelphia, Pa.): The report is in the hands of the Secretary.

(Secretary Mayo read the report, as follows:)

As representative of the American Veterinary Medical Association on the Advisory Board of the Horse Association of America, I present the following report.

Last year the work of the Horse Association of America up to that time was presented quite fully. It was found that many lines of investigation had been completed, all of which were favorable to the horse. Among those were comparative figures on the cost of hauling heavy loads and light delivery packages by horses and automotive power; overhead expense on auto trucks standing idle; plowing, harrowing and seeding on large and small farms; investigations in the production of new horses, etc.

During the past year the Horse Association has been endeavoring to put this information into the hands of the users of horse and automotive power. They have also been making other extensive investigations and have been very active in promoting the use and production of horses.

Many new booklets, setting forth the advantages of the horse in various kinds of work, have been published and distributed where they will do the most good. To make this report complete, I can

not do better than quote from Mr. Wayne Dinsmore's recent address before the Wholesale Saddlery Association of the United States:

"We have reached, directly, with letters personally addressed, and with facts and figures bearing on their own problems of haulage and delivery, the principal city users of transportation. We have done this over and over again, sometimes by cities, sometimes by industries, nation wide, with the result that virtually all firms now know of our work and have had the opportunity to compare their own costs with those of others in similar lines. We have won the confidence of large concerns that have complete detailed records of horse costs and work done, and we are now securing the most valuable data ever made available in our investigations.

"Some increase in horse use in cities is already evident. Whether this will offset the losses in other places we can not definitely determine as yet. New York, Boston, Philadelphia and Chicago apparently show some gain in horse use in the last year, judging from the specific increases of which we have knowledge. In other places, where our work has been less intensive, a loss may show to offset this. I am perfectly frank with you in these matters, for I want you to realize that motor truck manufacturers are everlastingly on the alert with their advertising, their agencies and their salesmen. One well-known maker of electrics is now selling their trucks for $100 down (plus $495 when delivered) and the balance in 21 monthly installments, and is making a special drive to sell to bakeries, laundries, towel supply companies and others that have light delivery work.

"To offset this, we are showing what a horse will do, what he costs, and how slight the investment and depreciation on horses, harness and wagons is, in comparison to the same factors with trucks. We must continue to do this, vigorously and steadily, if we are to sell horse use to merchants and other city transportation users.

"Overconfidence in respect to truck competition will be fatal, for we have already had to contend with ordinances calculated to legislate horses and mules off the streets, and new schemes of this kind are continually being framed up by truck salesmen who hope to benefit therefrom.

"We have the advantages of lower investment cost, slower depreciation and less expense in maintenance and repair, but our opponents have the advantage of a high-power sales force, skilled in salesmanship and big enough financial profit on each sale to make them work like blazes to close each deal. It is necessary that we work without ceasing, if we are to make headway against their sophistry.

"We have secured in the past some excellent costs in horses versus motor trucks, and have now in progress investigations into horse costs which are being taken from the financial records of very large users of horses in city work. These figures will set at rest all question as to the life of horses, amounts of feed required and harness and wagon costs, all of which have been subject to question and dispute from motor truck interests.

"Other work now under way includes studies on the distance traveled per day by retail delivery horses, with number of stops made; miles traveled per day by teams hauling coal, sand and lumber, with tonnage moved; and especial studies of the type of horses which last longest in city work. We also have negotiations in progress which will bring a large group of transportation users into cooperation with us on a study of hauling and delivery costs, in which we will check distance covered, tonnage hauled, stops made, time standing still and speed maintained while traveling. This is work that is urgently needed, has never been done, and which will be extremely valuable in defining the horse zone and horse costs.

"The breeding of horses and mules is now increasing, but moves slowly, as there is a lack of sires suitable for use, and in many communities no one farmer or group of farmers can be persuaded to make the investment required to secure a good stallion or jack. There is a marked shortage of young animals in nearly all States.

"I recently received letters from 136 farm auctioneers, located in thirty-two separate States. I asked them specifically whether there were enough young horses (under 3) coming on for replacement needs, and 121, or 89 per cent, of those answering said 'No.' Wyoming was the only State from which all replies indicated that there were plenty of young horses coming on. Our work this season has been directed toward impressing on farmers the shortage of young horses and to stimulate breeding. Leaflet 57, entitled 'Will It Pay,' has reached more than 150,000 farmers in the principal horse and mule producing States in the last two months. They can not fail to be influenced by the facts set forth therein, and the reports we have had indicate that breeding has increased considerably.

"With a view to establishing still more direct contact with farmers, we are now securing the names and addresses of the three leading farmers in each township in each county, for every State. This will carry our campaign still closer to the farm users and producers of horses and mules.

"Driving horses have been practically eliminated from our cities by automobiles, but many farmers who own cars are coming back to the good old driving horse for all ordinary length trips. We have given especial attention to the development of riding facilities and this season surveyed and marked nearly 200 miles of bridle trails through Cook County Forest Preserves and over connecting roads in Cook and DuPage counties. No organized effort to develop riding as a national sport was ever made until we took up the work.

"The response has been most admirable. Our cooperation in Chicago from the Forest Preserve Commissioners, local riders and highway officials has been 100 per cent. Riders in other cities are requesting our services in developing similar riding facilities in their districts, and nation-wide publicity in news stories about horseback riding has been abundant this past month.

"In my judgment, we are just at the beginning of the launching of riding clubs, horse shows, polo associations and riding interests in general. I am confident that no part of our work will show greater results in the next few years than that devoted to popularizing this, the oldest and most exhilarating of all sports."

It is not necessary to say anything further on the activities of the Horse Association of America. There is no doubt that this Association has done the horse industry a world of good and is in a position to do still more. This will be recognized by the members of the American Veterinary Medical Association, and it is hoped it will again render active support and cooperation to the Horse Association of America.

G. A. DICK.

DR. QUITMAN: I move that the report be received and the committee continued.

(The motion was seconded by Dr. Hoskins.)

DR. BUTLER: For the last year I have been more or less familiar with the work of the Horse Association, through receiving regularly the matter for publication which they issue. I have been unable to use very much of their material because I believe it is unwisely, unfairly produced. We might as well recognize it now, because it is a certainty that the truck and tractor are factors in farm power and farm transportation;

they are not going to displace the horse. They are probably not going to lessen the number of horses used, but they are factors in farm transportation and we might as well recognize it.

The Horse Association in the material that it puts out is not satisfied in stating the case for the horse, which I admit is strong enough if fairly presented. They make the mistake of so many propagandists of knocking the other side of the proposition; of making garbled and unfair presentations, in my judgment, regarding the tractors and trucks. I accept the main facts in their propaganda as correct, and I believe that this Association ought to cooperate with them; but I believe they are lessening, very much lessening, the effectiveness of their propaganda because it is unfair, because they make the mistake of knocking the tractor and the truck; and therefore I wish that this Association, through its representatives, could carry a word to the Horse Association, that if they will make their stuff that they send out deal with boosting the horse, giving the correct facts about the horse, and not giving garbled, and what I believe unfair, facts about the tractor and the truck, their material will get ten times the publicity and would be infinitely more effective. I for one would like to have a lot of stuff they have sent out published, but it absolutely meant editing in order to play fair to the other interests which we represent, and I didn't have the time to do it.

I make this statement purely and absolutely in the interest of the horse. I believe they can be more effective in their propaganda if they will take the proper view of the thing, that the truck and the tractor are here to stay, that they are factors and well established factors, economic factors in farm power. But there is still a place for the horse; he still has his superiority in many fields, and he still is going to be used. Let us boost that; let us put out facts regarding that; let us give everything we can regarding that; but let us leave the other alone because we can't head it off.

DR. L. A. MERILLAT: I would like to ask Dr. Butler in what particular connection the Horse Association is unfair. I would like to ask details about it.

DR. BUTLER: I am unable to give that now, for I did not know this thing was going to come up. But if I remember right I think I recall one of our editors, one of our coworkers who is not prejudiced in favor of the horse as I am (but as a matter of fact he is fair) said that the report or an article sent out based upon a bulletin by the United States Department of Agriculture was unfair and didn't give the information as it would have appeared had the whole of the facts been given. I have had hundreds of dozens of them where I thought it would have been very much more effective if they had left out some of the stuff they had in there and stuck to their cause.

I find every time I knock a competitor I boost him and it lessens the effectiveness of the statement. That is the only case I can call your attention to definitely, but I think I can get you a number of others.

DR. QUITMAN: I don't know whether Dr. Butler's remarks have any influence on the vote or not. It is very evident that Dr. Tait Butler was never run over by a tractor as was our very good friend Dr. Merillat. You can see the difference. I want to say that I have read a great deal of the literature of the Horse Association of America. I am a member of the association, and I do not agree with Dr. Butler that they could carry out their work just as well by boosting the horse as they do by making the deadly comparisons. What Dr. Butler terms knocking is comparison, and from what I know—at least I have seen the conditions—I believe that the Horse Association of America can prove every statement that they have made derogatory to the motive power whether it is farm or city power. I believe they can prove every statement. I know personally of a great many of those statements that are coming true. They make a great many statements that I don't know anything about, but I have seen comparisons and parallels made, and I believe that they can prove them. I believe, too, that they are doing a great and a good work for the veterinary profession, and they certainly should receive the hearty cooperation of every member of this organization.

(The motion was carried.)

APPOINTMENT OF COMMITTEE ON REVISION OF CONSTITUTION

PRESIDENT KINSLEY: I wish at this time to nominate the committee relative to the revision of the Constitution as per adoption of the committee report of Dr. McLeod. The names are as follows: J. R. Mohler, Chairman, C. A. Cary, J. H. McLeod, L. A. Merillat, and A. T. Kinsley.

REPORT OF DELEGATE TO CUBAN MEDICAL CONGRESS

PRESIDENT KINSLEY: Next we will take up the report of the Delegate to the Cuban Medical Congress, Dr. Eichhorn.

DR. A. EICHHORN: First of all I desire to express my appreciation to the President for giving me the opportunity to attend the National Medical Congress of Cuba as a delegate representing the American Veterinary Medical Association. The Cuban Congress is held every three years and is comprised of six various branches of the medical profession. One of the sections is given over to the deliberations of the veterinarians, while the others are those of the other branches of the medical sciences. The general deliberations were held at the general session, whereas the matters relating to the branches were discussed in the various sessions. The general meetings were in session two days, at which time papers pertaining to all phases of veterinary

medicine were read and discussed. The papers were of the highest standard and the discussions indicated that great interest was shown in the various problems confronting the veterinarians of the Cuban Republic. The subjects were most varied and pertained to the control of infectious diseases as well as to the diagnosis, prevention and treatment of the infections. I do not intend at this time to enter into a report of the various subjects presented, as I have published a report in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION relative to my attendance at the Congress.

There are approximately one hundred and thirty veterinarians in Cuba. Of this number about thirty are serving in the Army, twenty in the Bureau of Animal Industry, and the remainder either conduct private practice or serve municipal or other organizations. At the present time there is one veterinary college conducted in Cuba, this being a department of the University. The preliminary requirements for entrance into the College are the same as those required of the medical students, and from my meeting of the students and also recent graduates of the College, the standard is no doubt equivalent to those of other professions at the University.

The veterinarians in the Army are certainly to be congratulated for having succeeded in obtaining a distinct corps of that organization, being headed by a veterinarian. Furthermore, they have also a splendid laboratory with a well-trained staff of veterinarians, which not only is active in the routine laboratory work, but also produces the biological products not only for the prevention and treatment of the infections occurring among the army horses, but they also produce all the biological products used for the men in the military organizations of Cuba, such as typhoid vaccine, tetanus antitoxin, etc.

The Bureau of Animal Industry has not yet extended its activity corresponding to our organization in America. However, it is their aim to have suitable legislation enacted for such powers as will be necessary for their full control of the livestock on the Island. Dr. Crespo, who is the present chief of the organization, is very active and devotes all his time with the greatest energy toward that end.

The diseases which the practitioners are meeting are very much along the line of those occurring in the United States and Canada. During the discussions on tuberculosis I was asked why they met with cases of tuberculosis among the cattle which are imported to Cuba from the United States. That is a puzzling question, inasmuch as the native cattle of Cuba are practically free of tuberculosis. The shipments are tested by official veterinarians in the United States and in a retest it is found that a considerable number of the imported animals are affected with tuberculosis. It was, of course, difficult for me to explain the situation, and naturally the veterinarians are very

suspicious whether the testing in the United States is conducted with such care as would insure the importation of cattle free from the disease.

The social side of the Congress was also given splendid attention. Many foreign delegates attended, among these being the dean of the faculty of the Paris University, and the nephew of Pasteur, besides also delegates from the various South American countries. This tended to give the Congress somewhat of an international character. Among the social functions given was a reception for the President of the Republic, the President of the Congress, and many other entertainments which made the Congress a wonderful success from the social point of view.

Your delegate was shown the utmost hospitality by the Cubans, and was elected an honorary member of the Cuban National Veterinary Association. It is indeed gratifying that the initial step has been taken by the Cuban veterinarians toward establishing closer relation between the veterinary professions of the two neighboring republics, and it is hoped that this relation will be fostered in the future and that our Association will not lose the opportunity of inviting delegates from Cuba to attend our meetings. (Applause.)

(It was moved by Dr. Eagle and seconded by Dr. Quitman that the report be adopted.)

SECRETARY MAYO: On behalf of the American Veterinary Medical Association I extended an official invitation to the Republic of Cuba and also to the Republic of Mexico, asking them to send representatives to this meeting. Unfortunately, in both Cuba and Mexico the governments have had to retrench in the last few months in their economic and financial expenditures to such an extent that I don't think they felt they could do it.

(The motion was carried.)

REPORT OF REPRESENTATIVE ON NATIONAL RESEARCH COUNCIL

PRESIDENT KINSLEY: At this time we will call for the report of the representative on the American Research Council, Dr. L. W. Goss.

(Dr. Goss read the report, as follows:)

The National Research Council was established in 1916. The World War was the stimulus for its origin. In 1918 by an executive order of the President of the United States it was invited to reorganize as a peace-time organization which might stimulate research by increasing the cooperation and reducing duplication in research work.

The membership consists of representatives of the large scientific and technical associations of America. There are over forty such societies represented in the council. The secretary is the only permanent office. It is now held by Vernon Kellogg. The membership at present is about two hundred and fifty, divided among thirteen divisions. Seven of these are called divisions of science and technology, which devote their activities to the following fields: Mathematics

and astronomy, engineering, chemistry, geology and geography, medical sciences, biology and agriculture, anthropology and psychology. The six other divisions are relation divisions of the council as follows: Federal, foreign, States, and educational relations, research extension and research information service. These groups are subdivided into about eighty committees.

The Council is not an organization to carry on research work, but devotes its time and energy to getting together the workers and encouraging cooperation, assisting in the obtaining of support and acting in an advisory manner to research.

The funds for maintenance come from private and corporate benefactors. The Carnegie Corporation and the Rockefeller Foundation have contributed several hundred thousand dollars for current expenses. Various industrial concerns have contributed funds for special problems. The National Research Council is a place where such benefactors may place their funds and feel that they will be spent to the best advantage for research.

In 1921 a place was made in the Division of Medical Science for a representative of the American Veterinary Medical Association. The writer was appointed by the President of the A. V. M. A., the approval occurring shortly before the annual meeting at Washington in April. During the following year a survey of the experiment stations of the United States was made in an effort to determine what projects were under way and the amount of money allotted to each. It shows in a general way the projects and the available funds. There are some States from which reports were not available. The appropriated funds do not indicate the true expenditures, as they include salaries of the men in some cases, while in others the salaries are excluded. There are some States showing no funds for projects, nevertheless they are doing considerable work upon certain problems.

It is hoped that the following will be of assistance to those who are working on a project, by showing them where work is being done in their particular field.

Research Work at the Experiment Stations of the United States

Project	States	Funds
Abortion	B. A. I.	$25,000
	Michigan	13,000
	California	12,970
	Illinois	10,000
	Minnesota	8,085
	Oregon	5,000
	Kansas	5,000
	Missouri	3,500
	New York	3,500
	Arkansas	1,050
	Colorado	1,000
	Wyoming	875
	Wisconsin	500
	Pennsylvania	?
	Massachusetts	?
	Ohio	200
	Total	$89,680
Anthrax	B. A. I.	$475
	Louisiana	250
	Total	$725

Project	States	Funds
Bacillus necrophorus	Wyoming	$250
Bighead of sheep	Texas	?
Biological investigations	B. A. I.	7,525
Botulinus	Illinois	15,000
Bovisepticus	Pennsylvania	?
Diseases of animals:		
Diseases of swine	Colorado	$2,600
	North Dakota	2,000
	New York	2,000
	California	1,000
	Total	$7,000
Obscure diseases	Minnesota	$6,225
	Nevada	6,100
	Washington	6,000
	Texas	?
	Total	$18,325
Diseases of poultry:		
Roup, chicken pox	California	$2,700
Miscellaneous poultry diseases	California	6,317
Roup, white diarrhea	Delaware	1,000
Gapes in chickens	West Virginia	?
Poultry diseases	Kansas	500
Tapeworm of chickens	Kansas	100
Roup	Kansas	850
Poultry diseases	Michigan	2,100
Chicken pox, roup	New Jersey	2,000
Blackhead in turkeys	Rhode Island	2,000
Diseases of fowls	B. A. I.	1,575
White diarrhea	Ohio	?
Typhoid, white diarrhea	Rhode Island	2,000
White diarrhea	Massachusetts	?
Blackhead in turkeys	Connecticut	?
Tumors, diarrhea, blackhead, drugs, climate, anatomy, physiology, nutrition	North Carolina	5,000
	Total	$26,142
Forage poisoning	B. A. I.	$3,050
	Colorado	500
	Total	$3,550
Goiter in calves	Wisconsin	$200
	Ohio	?
Hog cholera	B. A. I.	$25,500
	Minnesota	3,934
	North Dakota	2,500
	Total	$31,934
Infectious anemia	North Dakota	$3,000
	Texas	?
	Wyoming	875
	Total	$3,875
Johne's disease	Wisconsin	$200
Lungworms in calves	West Virginia	?
Meningitis	New York	$500

Project	States	Funds
Parasites	B. A. I.	$30,100
	Kansas	1,300
	Louisiana	250
	Pennsylvania	?
	West Virginia	?
	Total	$31,350
Poisonous plants:		
Vegetable poisonings	Nevada	$8,550
	B. A. I.	15,000
	Wyoming	200
	Total	$23,750
Pyemic arthritis	Minnesota	$450
Sheep losses in feed lots	Colorado	$10,000
Rabies	B. A. I.	$1,575
Tuberculosis	B. A. I.	$12,200
	California	3,000
	Minnesota	1,185
	Illinois	500
	Total	$16,885

The above does not take into consideration the valuable researches under way at the Rockefeller Foundation for the investigation of diseases of animals, where Dr. Theobald Smith has a corps of workers who are doing some excellent work, as past reports have shown. In addition a few of the biological houses are also doing some research.

There has been a general feeling that more men should be encouraged to enter the teaching profession. This has brought about a gift of $100,000 a year for a period of five years by the Rockefeller Foundation and the General Education Board. This money is to be used for teaching fellowships. They are to be given to men who hold an M. D. or Ph. D. or the equivalent. The above would imply that it is possible for a man who has had premedical work and the degree of D. V. M. to acquire a fellowship provided he can meet the other requirements.

It is hoped that the support and approval by the National Research Council will be a stimulus which will result in greater appropriation and the betterment of veterinary education.

A glance at the survey of the experiment stations shows that the abortion project is the one which is receiving the greatest attention. However, several States which contain large numbers of cattle are allotting very small sums to the work. This condition makes it clear that greater appreciation for research in this disease is still needed in some States.

By the activity of Dr. C. P. Fitch, Chairman of the Abortion Committee, with the Division of Biology and Agriculture, and a request from the writer to the Division of Medical Sciences for the appointment of a joint committee on abortion, the following were appointed: Dr. E. D. Ball of the United States Department of Agriculture; Dr. C. P. Fitch, and the writer as chairman. This committee will meet in the near future and formulate plans by which it is hoped that more funds will be made available for this work and that the cooperation between the workers may be increased.

It is desired that interested persons communicate with the committee with their suggestions relative to ways and means for more liberal support.

The manner of the organization of the National Research Council is so far-reaching that it will bring together many forces which can

only result in great benefit to all associations which are connected with it. LEONARD W. GOSS.

On motion of Dr. V. A. Moore, seconded by Dr. Hoskins, it was voted that the report be received.

REPORT OF COMMITTEE ON NARCOTIC LAW REVISION

PRESIDENT KINSLEY: The next order we will take up is the report of the Commitee on Narcotic Law Revision. Dr. J. P. Turner is chairman of the committee, and the report is in the hands of the Secretary.

(Secretary Mayo read the report, as follows:)

On March 2, 1922, your committee, in conjunction with similar committees of the American Medical Association and the National Dental Association and other committees representing pharmacists, and representatives of trades and industries supplying these professions with narcotics, met at the New York Academy of Medicine to formulate a uniform law, based on the Federal Harrison Narcotic Act, which should be used in the various States of the Union. Dr. Haven Emerson presided.

The conference decided to follow the Harrison Act so far as possible in framing a uniform State law.

A motion to prevent duplication of records was carried.

It was further agreed that no State should adopt regulations in conflict with the Harrison Act.

The subject of the treatment and care of drug addicts was considered as requiring additional legislation not within the scope of the act now being formulated, and the conference was of the opinion that the consideration of administrative methods in the treatment of drug addiction did not come within the scope of its work at the present time.

The conference further agreed that in the enforcement of any State narcotic control law the act should specifically state which administrative body of the State should enforce the law.

Your committee made a strenuous effort to get the annual tax of $3 under the Harrison Antinarcotic Act reduced to $1, by means of a motion of the conference, but did not succeed. We were successful in the matter of not having the model State law created as a revenue act, thus saving the practicing veterinarian from paying another tax.

Another feature of the proposed State law was a paragraph making it mandatory for the State licensing board to revoke a practitioner's license when convicted of violation of the Antinarcotic Act. We opposed this provision, as many veterinarians might be convicted of some slight technical offense, such as failure to keep his narcotic blank books properly posted, and be haled into court by some overzealous inspector. Upon our opposition the word "may" was inserted in the proposed act, instead of the word "shall," as relating to the revocation of licenses by State boards upon the conviction of a practitioner by the courts.

It was the sense of the meeting that such revocation by any board of examiners should not occur for a mere technical violation of a State antinarcotic law, but should be held as a punishment for repeated wilful violations, and convictions under this law.

The sense of the conference was that a committee of five be appointed to draft a model State law, and that the various professions and industries should advise them by written suggestion, but that the Harrison Antinarcotic law should be generally followed as a model.

After some further discussion as to amendments to the Harrison law, relative to the dispensing of codein and morphin, the conference adjourned. J. P. TURNER, *Chairman.*

Dr. Flower moved that the report be adopted, and the motion was seconded.

DR. QUITMAN: I can't get the idea of adopting this report. We can accept it. There is no suggestion in it particularly that we are to be guided by, consqeuently I can not see any good reason for adopting it.

PRESIDENT KINSLEY: If the report is adopted the committee is discharged.

DR. QUITMAN: I believe that committee should insist on deleting apomorphin hydrochlorid. I think that should be separated from the narcotic regulation, because it would be utterly impossible, I believe, for any human being ever to become addicted to apomorphin hydrochlorid, and of all narcotics now used that is the one that is most used, and it is a good deal of trouble to keep track of every dose that we administer, particularly in the small-animal practice. It seems to me if this committee had done anything worth while they should have gotten this one thing. I can't see that they have made any suggestion worth while adopting.

DR. FLOWER: I will withdraw my motion and substitute the word "receive" for "adopt."

PRESIDENT KINSLEY: Dr. Flower withdraws his motion and places a new motion that the committee report be received and that the committee be continued.

(The motion was carried.)

DR. QUITMAN: Is it in order to make a motion or to suggest to this committee that inasmuch as they stand continued they lend their efforts to try to have the apomorphin hydrochlorid deleted from the prescribed narcotic list? If so, I will make a motion that the committee be instructed to work with that end in view.

PRESIDENT KINSLEY: I believe that is perfectly in order.

(The motion was seconded and carried.)

REPORT OF EXECUTIVE BOARD

PRESIDENT KINSLEY: Dr. Mayo will make a short report from the Executive Board at this time.

DR. MAYO: The Executive Board recommends that the resignations of Dr. R. P. Lyman of East Lansing, Michigan; Dr. J. O. Greeson of Kokomo, Indiana, and Dr. W. J. McKinney of Brooklyn, New York, be accepted.

(On motion of Dr. Quitman, seconded, the report was adopted.)

DR. MAYO: The Executive Board also recommends that the resignation of Dr. S. H. Burnett of Denver, Colorado, be not accepted, but that in view of his distinguished services to the

veterinary profession he be continued on the roll of the Association.

(On motion of Dr. Hoskins, seconded, the recommendation was adopted.)

DR. MAYO: The Board also recommends that Dr. H. Nunn of Corvallis, Oregon, be carried on the roll. Dr. Nunn is in a State hospital at Corvallis, evidently suffering from a mental trouble. When I learned this I immediately made inquiry to find if he was in need of relief. The directors of the hospital said he was not, that he was receiving all the treatment that could be utilized. The Doctor writes occasionally, and he enjoys receiving the JOURNAL.

(On motion of Dr. Hoskins, seconded by Dr. V. A. Moore, the recommendation was adopted.)

REPORT OF COMMITTEE ON LEGISLATION

PRESIDENT KINSLEY: We will have the report of the Committee on Legislation at this time.

(Secretary Mayo read the report, as follows:)

The following is a résumé of legislation by the Sixty-seventh Congress, second session, affecting the Veterinary Service of the Army:

House Bill 10871, which limits the total number of officers and enlisted men of the Regular Army, as passed by the House of Representatives, provided for not to exceed 109 commissioned officers of the Veterinary Corps. As this bill passed the Senate it provided for 144 commissioned officers of the Veterinary Corps. In conference the representatives of the House and Senate agreed upon 126 officers, those in excess of this number to be eliminated by December 31, 1922, under the following procedures, viz: Normal retirement at 64 years of age; retirement at the request of an officer after 30 years' service; retirement for physical disability incurred in the line of duty, all of which give the officer retired three-quarters of his present pay; and elimination by Class B as provided under paragraph 24 of the act approved June 4, 1920, which separates from the service officers who are below par in efficiency, with one year's pay. Officers remaining surplus after the operation of these methods will be selected out by a board of general officers convened in Washington for this purpose. It is provided that all officers having less than 10 years' commissioned service in the Regular Army shall be discharged with one year's pay.

The following quotations from the statute cover these matters:

"*Provided further*, That officers in excess of the numbers authorized herein and not removed from the active list by other means shall be disposed of as follows: Those of the Medical Department and chaplains shall, prior to January 1, 1923, be eliminated from the active list as hereinafter provided. * * * Officers selected for elimination of less than ten years' commissioned service may, upon recommendation of the board herein provided for, be discharged with one year's pay. * * * *Provided further*, That commissioned service for the purposes of this act shall include only active commissioned service in the Army performed while under appointment from the United States Government whether in the Regular, provisional, or temporary forces.

"*Provided further*, That any officer of less than ten years' commissioned service but of more than twenty years' service accredited

toward retirement or for increased pay for length of service may, in lieu of discharge with one year's pay as hereinbefore provided, if he so elects, be appointed a warrant officer and carried as an additional number in that grade; or he may, if he so elects, be retired with the rank of warrant officer with pay at the rate of 2 per centum of the pay of a warrant officer multiplied by the number of years of such accredited service; *Provided further*, That the Secretary of War shall convene a board of five general officers which may include retired officers, whose call to active duty for this purpose is hereby authorized, which board, under regulations prescribed by the Secretary of War, shall recommend to the President the officers to be eliminated from the active list under the provisions of this act."

All officers of the Veterinary Corps, Regular Army, have less than 10 years' commissioned service as it is defined in this act, since none was commissioned prior to the act approved June 3, 1916. Consequently all veterinary officers of the Regular Army who came into the service subsequent to 1912 who are selected out will receive one year's pay. Those who entered the service prior to 1912 may take advantage of a choice of accepting one year's pay, of being appointed a warrant officer and carried as an additional number in that grade, or of being retired with the rank of a warrant officer with pay at the rate of 2 per centum of the pay of a warrant officer multiplied by the number of years of such accredited service. The monthly base pay of a warrant officer of the Army is $148 per month.

On July 1 the strength of the Veterinary Corps was 158 officers. Under this law 32 officers must be either retired or discharged by December 31, 1922. This will mean that a very large per cent of these 32 officers eliminated will be Class A officers who have fulfilled all requirements of the service satisfactorily. The only reason for their elimination is that the law must be complied with, and the fact that such officers will be eliminated can not be considered a reflection on their professional or moral standing.

Statistics show that 4.5 veterinary officers are required for each 1,000 animals in the Army. This figure covers all overhead, including the purchasing of animals, the inspection of forage, the inspection of meat and meat food products at procurement points and reinspection in storage and at points of issue, the detail of instructors at various service schools for the purpose of instructing in animal management and horseshoeing, providing administrative officers and the hospitalization and treatment of authorized private and public animals at stations and in the field. The present animal strength is approximately 50,000, which is less than was maintained at any time during ten years prior to the war. Based on the above per centum, 225 veterinary officers are required to maintain an efficient service.

The National Defense Act as amended June 4, 1920, provided for an Army which required approximately 350 veterinary officers. At that time, in view of the possible motorization of various units, it was not considered economical or to the best interests of the country for Congress to authorize a permanent Veterinary Corps of this size, but 50 per cent of this number as permanent appointees was provided for with the expectation that the remainder would be assigned to active duty from the Reserve Corps as required. Unfortunately, in framing the appropriation for the Reserve Corps no provision was made for the assignment of reserve officers to active duty other than for a period of not more than 15 days during a year, which permitted the use of these officers in the Veterinary Service for training purposes only. The appropriation for training was so small that practically no officers were given this training.

The present act cuts the Veterinary Corps as provided for in the Act of June 4, 1920, from 175 to 126 officers. This cut was made

without considering that the animal population will probably remain the same as it was during the past fiscal year which means that the 126 veterinary officers will be required to perform the duties of approximately 175 officers or more. In order that the Veterinary Corps, Regular Army, may be given an opportunity to develop and demonstrate the economy of an efficient Veterinary Service in the Army, a return to the number authorized in the Act of June 4, 1920, is essential, namely, a minimum of 175 veterinary officers, with provision to employ reserve officers, with their consent, in addition, during the summer training period, in such numbers as are required for an efficient service.

Congress has also enacted a law to readjust the pay and allowances of the commissioned and enlisted personnel of the Army, Navy, Marine Corps, Coast Guard, Coast and Geodetic Survey and Public Health Service. A brief synopsis of its effect on the pay of officers of the Veterinary Corps is given below, the monthly pay shown being that which an officer receives on promotion to the grade.

		Rental		Subsistence	
Grade	Monthly Pay	With dependents	No dependents	With dependents	No dependends
Colonel, 26 years' service	$466.66	$120	$80	$36	$18
Lieut. Colonel, 20 years' service	379.16	120	80	54	18
Major, 14 years' service	300.00	100	60	54	18
Captain, 7 years' service	220.00	80	60	36	18
1st Lieutenant, 3 years' service	175.00	60	40	36	18
2d Lieutenant, less than 5 years' service	125.00	40	40	18	18

The rental allowances are applicable only where an officer is on detached service and is not furnished quarters by the Government.

The column "With Dependents" applies to an officer married or a widower having children under 21 years of age or an officer having a dependent mother.

The column "No Dependents" applies to a bachelor officer not having a dependent mother.

Our committee has also done all that was possible to get favorable action on the bill providing for reclassification of civil-service employees in the Federal service, which is still pending in Congress.

S. J. WALKLEY, *Secretary.*
J. G. FERNEYHOUGH.

On motion of Dr. Marsteller, seconded, the report was received.

NATIONAL RESEARCH COUNCIL

DR. HOSKINS: When the report regarding the National Research Council was disposed of there was no provision made either for the continuance or the discontinuance of the committee. In view of that fact, and also the importance of the work of that committee, I move, so there will be no misunderstanding, that the committee be continued.

(The motion was seconded and carried.)

Adjournment.

OTHER MEETINGS

NORTH CENTRAL OHIO VETERINARY ASSOCIATION

Dr. H. B. Ropp of Ashland, Ohio, was elected President of the newly organized North Central Ohio Veterinary Medical Association, at its first meeting at Ashland on July 27. Dr. W. F. Wise of Medina was elected Vice President, Dr. C. C. Wadsworth of Mansfield was chosen Secretary, and Dr. M. C. McClain of Jeromeville, Treasurer.

After considerable discussion as to the number of meetings the organization would have during the year, it was finally decided to leave it to the Executive Committee to fix all dates of future meetings. After the business meeting, with the election of the above named officers, a clinic was held, after which a dinner was served at one of Ashland's well-known restaurants. Drs. Case, Krieder, Derr, Schafstall, P. Fulstow, H. Fulstow, McClain, Merillat, Wadsworth and Wise took part in the clinic. The evening session was held at the Elks' Home at which time Dr. H. H. Lehman, in charge of the information bureau of Hess & Clark Laboratories, gave a very thorough explanation of avian tuberculosis and its treatment. Dr. G. W. Cliffe, of Upper Sandusky, President of the Ohio State Veterinary Medical Association, delivered the main address of the evening. He denied the charges made by some people that the veterinary association throughout Ohio was a political and price-fixing group, but instead it consisted of groups of scientific men associated for the purpose of mutual discussion of all the intercommunicable, contagious, and infectious diseases that are constantly threatening the livestock industry of the country, as well as the economic welfare of the people of our Commonwealth. Twenty-eight charter members of the association were in attendance. C. C. WADSWORTH, *Secretary.*

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the California State Veterinary Medical Association was held in Los Angeles, June 5 to 7. The program consisted of clinics and papers, all of which were completely rendered.

Monday morning a general clinic on large animals was held under direction of Dr. W. R. Carr, assisted by Drs. G. W. Closson, M. Johnson, C. F. Litton and others, at the hospital of Drs. W. R. Carr, C. A. White and R. M. Leaf. It was full of interesting subjects and created great interest.

The afternoon program was held at Normal Hill Center. Interesting papers were read by Drs. John L. Tyler, C. F. Litton, J. P. Iverson (State Veterinarian) and M. Rosenberger; also Dr. R. J. Bell, whose paper on "Breeding Problems from the Dairyman's Standpoint," was exceptionally well rendered and pointed out the dairyman's side of this most important question, as was the paper by Dr. J. L. Tyler.

The second day's meeting contained such subjects as "The Garbage Hog," by Dr. L. M. Hurt; "Hog Cholera Virus and Its Biologic Characteristics," by Dr. Robert Jay; "Antisera, Aggressins and Prophylaxis," by Dr. J. G. Jackley, and the treat of the meeting in an exhaustive paper by Dr. A. T. Peters of Peoria, Ill., all of which brought out very instructive and interesting discussion.

A banquet for members and ladies was held at the Virginia Hotel, Long Beach, at which Dr. L. M. Powers, M. D., gave a most interesting talk on "The Veterinarian and His Relation to the Public Health."

The morning of the third day was devoted to a small-animal clinic under the direction of Drs. C. A. White and T. H. Agnew, assisted by Drs. F. H. Bescoby, W. A. Boucher and Oscar Kron.

The afternoon program consisted of papers by Dr. W. L. Curtis, "Foxtail Infections in Small Animals," and "Rabies and Its Control," by Dr. J. F. Kenna, both of which—dealing with important questions in California—brought out much useful information.

The election of officers resulted in Dr. John L. Tyler, Huntington Park, being elected President; Dr. Oscar Kron, San Francisco, Vice-President; Dr. J. P. Bushong, Los Angeles, Secretary, and Dr. James Boyd, Milpitas, Treasurer.

San Francisco was selected as the next meeting place for the first Monday in June, 1923. The meeting adjourned with everyone expressing the opinion that this had been the best meeting ever held.

J. P. BUSHONG, *Secretary.*

WEST VIRGINIA VETERINARY MEDICAL ASSOCIATION

The annual meeting of the West Virginia Veterinary Medical Association was held at the Chancellor Hotel, Parkersburg, July 26 and 27, 1922, when a program covering an unusual scope was carried to a large attendance, all officers being present.

New officers elected for the ensuing year were: President, Dr. Ernest Layne, Huntington; Secretary-Treasurer, Dr. J. J. Cranwell, Fairmont.

A fine clinic was held at the hospital of Dr. J. C. Callander.

Dr. Neff, who is in charge of tuberculosis eradication work in West Virginia, was present, and also four of his assistants. Dr. Neff clearly defined his work here and also the cooperation of practitioner and Federal employees which he says we must have for success of both.

The visiting ladies and members were entertained by a banquet and moonlight sail on the beautiful Ohio River.

All voted that this meeting was the best ever held by this association. It was also rumored that a midwinter meeting might be held in Charleston, when our legislative body is in action, to try for new veterinary laws badly needed in our State.

Four new members were taken into our association. A very strong plea was made by the Secretary to the new members, as well as any old members who were not members of the A. V. M. A., to join before the meeting at St. Louis, and all attend in a body. J. J. CRANWELL, *Secretary.*

NEW YORK STATE VETERINARY MEDICIAL SOCIETY

The thirty-second annual meeting of the New York State Veterinary Medical Society was held in the State Armory, Syracuse, N. Y., July 26 to 28. The meeting opened with the largest attendance ever recorded in the history of the Society. Both attendance and interest grew as the meeting progressed.

During the morning session of the first day the time was taken up by the regular order of business. Dr. D. H. Udall, as President of the Society, read a carefully prepared address pointing out the conditions of the veterinary profession in the State and indicating methods by which improvement might

be brought about. This address is worth the careful study and attention of every man in the profession. The Society voted that it, together with the paper by Dr. W. E. Frink on "Organization of Veterinarians in New York State," which was read at the annual dinner held the evening of the first day of the meeting, be presented for publication to the JOURNAL of THE AMERICAN VETERINARY MEDICAL ASSOCIATION. These papers will thus both be available to all who are interested in them. Reports of various committees were read during the morning session. The Board of Censors recommended 43 new members for membership during the different sessions. All those who were recommended were elected. This number marks the largest number of members elected in any one year. Thirty-two, which is the next highest number, were elected at the Brooklyn meeting in 1919.

Major C. H. Jewell had been detailed by the War Department to present the matter of the Veterinary Reserve Corps to the Society. He was given the first place on the afternoon program, and much interest was in evidence in that branch of the service as a result of the talk by Major Jewell and one following at a later time and upon the same subject by Colonel Uline, stationed at Syracuse and in charge of the Medical Division, 98th Division, Organized Reserves.

The Committee on Resolutions was instructed to prepare and the Society passed the following resolution:

Whereas, The medical and dental professions have more than filled their quotas in their respective branches in the Reserve Corps of the U. S. Army;

And whereas, In the Veterinary Reserve Corps there is a considerable deficiency in the number of applicants;

And whereas, The veterinary profession during the recent war showed as much loyalty and sacrifice as other professions;

And whereas, The deficiency in the number of applicants seems to reflect on the patriotism of the profession:

Therefore be it resolved, That the New York State Veterinary Medical Society urge those of its members who are eligible to apply for admission in the Reserve Corps, thereby correcting any wrong impression as to their apparent indifference to this important National Service.

Dr. R. H. Spaulding was to have prepared a paper on "Abortion, Septic Metritis, Pyometra, Cystic Ovaries and Sterility in Cats." Dr. Spaulding has had considerable experience with these conditions, and we hoped to hear the paper. He, however, has just gone into a new location, and being extremely busy in locating a new hospital, was too busy to prepare the

paper. The Society will have the pleasure and instruction of his paper in the future.

Dr. A. E. Merry of Syracuse read an instructive paper on "The Management of a Small-Animal Practice." Several men engaged in practice with small animals discussed the paper, to the interest and benefit of all.

Drs. E. V. Moore and J. L. McAuliff of Cortland have had considerable experience with "Hemorrhagic Septicemia in Cortland County" and Dr. McAuliff read the paper which they had jointly prepared. These two young men constitute a firm of progressive and successful practitioners and are doing much to uphold the highest ideals of the profession. There was much instructive discussion on this paper.

Dr. J. W. Fuller, engaged in work on poultry diseases at the New York State Veterinary College at Cornell University, gave a "Demonstration of the Physical Examination of Poultry," which was very practical and created marked interest. The demonstration was real, for Dr. Fuller used a live bird first to show methods of restraint and examination, then of killing the bird and conducting a postmortem.

The evening session was held at the Hotel Onondaga. The annual dinner was the first feature of this part of the meeting. Dinner service was delayed for a considerable time because the staff had to prepare for about twice as many people as they had been advised would be present. This delay was not minded, for it gave opportunity to converse, and when dinner was served it was splendid and thoroughly enjoyed. Mayor Walrath gave the address of welcome on part of the City of Syracuse. Dr. E. L. Volgenau of Buffalo gave the response for the Society. The principal address was by Dr. W. E. Frink of Batavia on "Organization of Veterinarians in New York State," to which reference has been made. At the meeting last year held at Buffalo a committee composed of Drs. W. Reid Blair, W. E. Frink and D. B. Comstock was appointed to confer with Judge B. A. Pyrke, Commissioner of Farms and Markets of New York State. Through the work of that committee Dr. Frink became more cognizant of the dire need of organization and better representation of the practitioner. His paper, which will soon be printed, is an able exposition of the topic and should be read by all interested in the welfare of the profession. The report of the Committee on Resolutions had been laid over

until this time and was accordingly presented. This report was in sympathy with the dominant idea of the meeting, and the resolutions as adopted are as follows:

RESOLUTIONS RELATIVE TO VETERINARY PRACTICE

Whereas, Leaders of animal husbandry of the State proclaim that the greatest hindrances to the prosperity of animal industry are the losses caused by disease;

And whereas, The livestock owners have come to realize the necessity of having competent veterinary service immediately available when needed to safeguard them against the destructive effects of diseases in their flocks and herds;

And whereas, The accumulation of knowledge in the sciences included in veterinary medicine has made it necessary for those who enter the profession to devote many years to study and to expend much money in securing the required training in the nature of animal diseases and methods for their control;

And whereas, The limited number of animals in a farming community, and the great variety of diseases from which they suffer, require the veterinarian to perform all the work in the locality for the restricted animal population, precluding the possibility of practitioners specializing to any appreciable degree;

And whereas, It has been the practice in recent years of the State and Federal Governments to take over tuberculin testing, free of charge, that the local veterinarians were trained to do as a part of their professional duties;

And whereas, This beginning of state veterinary medicine is discouraging young men from entering the profession, which will soon leave animal owners without veterinarians for the great majority of the diseases for which they need such service;

And whereas, Cattle owners are anxious to have efficient veterinarians and are willing to pay for professional services for which they themselves profit;

And whereas, It is not believed that the agricultural interests desire the services of the practicing veterinarians to be restricted or abolished:

Therefore be it resolved, That the New York State Veterinary Medical Society request the Commissioner of Farms and Markets to assist the animal owners by permitting the local veterinarians to do as much of the livestock sanitary work as possible.

And be it further Resolved, That this Society ask the Commissioner of Farms and Markets to recommend tuberculin testing by accredited practitioners at the expense of the owners, thereby encouraging more efficient veterinary service for the agricultural districts and reducing greatly the expense of such work to the State.

And be it further Resolved, That the Federal Bureau of Animal Industry be requested to cooperate with the Commissioner of Farms and Markets to arrange proper inspection of the tuberculin tests to the end that the cattle owners will be assisted in the elimination of tuberculosis from their herds by the receipt of such indemnities for reacting animals as the State and Federal Governments may be willing to provide.

And be it further Resolved, That this Society pledge to the Department of Farms and Markets and to the Federal Bureau of Animal Industry its honor and loyalty in making and reporting all tuberculin tests and other reportable conditions, and that it will exert its every effort to assist the State and Federal authorities to bring to justice any practitioner of the State who violates the sacred obligation of professional honor in the conduct of his work.

And be it further Resolved, That copies of these resolutions be sent to the Commissioner of Farms and Markets, to the Secretary of Agriculture, to the Chief of the Federal Bureau of Animal Industry, to the veterinary journals of the country and to the agricultural press of New York State.

RESOLUTION ON STATE MEDICINE

Whereas, Interest in control of disease has led to extensive development of local, State and Federal organizations for this purpose, their combined activities falling under the general term "state medicine";

And whereas, Within the past few year the course of applied veterinary medicine has been transformed in its relation to the state;

And whereas, Fear that much of the service of the practitioner might be abolished has contributed to a decreased interest in veterinary science which has led to both public and private loss:

Therefore be it Resolved, That the New York State Veterinary Medical Society, recognizing the wisdom and necessity of conserving both State and private effort in disease control, suggests the desirability of a better understanding to the end that progress be not slackened through apprehension or distrust.

Resolved, That this resolution be transmitted to the A. V. M. A. with a suggestion that the control of disease in animals depends on the services of the private veterinary practitioner, with a further suggestion that the National Association assume a more definite policy in the preservation of this vanishing group, and that it be more adequately represented in the JOURNAL of the Association.

RESOLUTION ON THE SCOPE OF VETERINARY PRACTICE

Whereas, Within the past few years the work of the practitioner of veterinary medicine has undergone a radical change through the demand for herd prevention and control of all forms of disease, and individual emergency cases demanding immediate attention are less frequent;

And whereas, Officials, agricultural representatives and others are sometimes advised that certain incidental phases of this work, such as tuberculin testing, vaccinations, etc., are not desired by the average practitioner because they interfere with his emergency work:

Resolved, That it is the opinion of this Society that such incidental routine forms an important and essential part of the public service of the average practicing veterinarian; that in many cases it constitutes an important and essential source of income; that with few exceptions he is in position to give such service, and that those interested in fostering the extension of veterinary service beyond the immediate areas of large towns should not be deceived by such advice.

The committee appointed to confer with Commissioner Pyrke had accomplished so much in its effort to bring about closer relationship between the practitioner, the Federal Bureau of Animal Industry and the State officials that Dr. W. G. Hollingworth moved that a committee composed of Drs. D. H. Udall, George Knapp and D. B. Comstock be elected to carry on the work. The election of the committee was unanimous. The sentiment of the Society is to carry on this work started by the original committee after another year as a permanent organization with a permanent secretary. The effort to bring about

closer cooperation between all interests is bearing fruit and the good work should be kept up, as it will be with a committee having the personnel of the one elected this year.

The morning session of July 27 carried out the same basic idea of organization as had the previous one. "State Organization for the Control of Disease in Livestock" was given by Dr. T. E. Munce, Director, Pennsylvania Bureau of Animal Industry. Hon. B. A. Pyrke, Commissioner of Farms and Markets for New York State, spoke on the topic "New York State Organization for the Control of Disease in Livestock." H. S. Bigler, President, New York State Holstein-Friesian Association, gave a paper on "The Cattle Industry of New York State; Its Relation to the Administration of Disease Control in Live Stock." "Holstein-Friesian Association Sale Regulation for Protection Against Disease" was the topic of a paper read by E. R. Zimmer, Secretary, Holstein-Friesian Association of New York State. D. W. McLaury, Chief of the Bureau of Animal Industry of New York State, gave an address. The United States Bureau of Animal Industry was ably represented at the meeting by Dr. Lash, a member of the Washington staff. Dr. H. W. Turner, Pennsylvania Bureau of Animal Industry, read a paper on "Tuberculin Technic." Space forbids a discussion of the good points of these papers and of the discussions they called forth. Most of them will appear in the veterinary journals of the country and their value will thus be preserved.

The morning session was a long one, for the business had to be completed before adjournment. Ithaca was decided upon as the place of the next meeting. Dr. W. Reid Blair was elected President, Dr. R. W. Gannett Vice-President, Dr. C. E. Hayden Secretary-Treasurer and Dr. H. J. Milks Librarian.

During the afternoon session Dr. H. W. Turner demonstrated the various tuberculin tests and reaction with twenty cattle. Autopsies were held. Dr. E. T. Faulder was assigned to assist Dr. Turner. With Dr. Faulder were Drs. Derrick, Linch, Bales and Grace. The Society is deeply indebted to Dr. Turner and to the representatives of the Bureau of Animal Industry who did so much to make this part of the program a success.

Clinics were held during the morning of the 28th. Dr. W. L. Williams had a large number of sets of genital organs which had been sent down from Buffalo. These he used for demonstration of the diseases of genital organs. Dr. W. W. Williams

performed an amputation of the cervix. Dr. J. N. Frost did a rumenotomy. The clinics were well attended and of great interest.

The activities of the Society closed with the clinics, but there was a further program in the afternoon for which many of the members stayed over. The Society for the Study of the Diseases of the Genital Organs had a session in the State Armory and there were four very fine papers presented of interest to all engaged in such work.

The thirty-second meeting of the New York State Veterinary Medical Society was a success from the standpoint of program and numbers in attendance. This meeting marks a new era in the history of the Society. C. E. HAYDEN, *Secretary.*

At the last meeting of the Tennessee Veterinary Medical Association, held in Memphis July 27-28, a schedule of uniform charges for testing cattle for tuberculosis was adopted. This action will prevent much confusion and create a better understanding between the practitioner and the accredited herd owner.

The Tennessee Veterinary Medical Association, in session July 27-28 in Memphis, Tennessee, temporarily suspended the by-laws to admit into the association, without the payment of fees, all B. A. I. veterinarians working in the State. Immediately following, this was submitted as an amendment to the by-laws, for action a year hence, to automatically make all B. A. I. men in Tennessee active members of the T. V. M. A.

Cordial relations are being cultivated between the medical and veterinary professions of Great Britain. Following the combined meetings of the Royal Society of Medicine and the Central Branch of the National Veterinary Association last year, the Royal Society has opened its membership to veterinarians, who are admitted on the same terms as physicians. The Sections of Medicine and Pathology have each elected a veterinarian on their respective councils. The National Veterinary Association has joined the Federation of Medical and Allied Services. The British Medical Association has placed a veterinarian on the program of its coming annual congress and veterinarians are invited to attend and to join in the discussion. Such cooperation is sure to benefit both professions.

NECROLOGY

Dr. Wm. J. Waugh, of Washington, Pa., died suddenly of apoplexy while attending a patient at the fair grounds, on August 16, 1922, aged 65 years. He was a native of Pennsylvania, a graduate of the Ontario Veterinary College, class of 1882, and was Regiment Veterinarian of the 3d Cavalry, U. S. A., for 15 years, resigning after the close of the Spanish-American War. He then resumed an active general practice.

He was an expert surgeon and capable practitioner, and acquired a competency. He was a member of the A. V. M. A., Pennsylvania Veterinary Medical Association, Masonic Fraternity, and a town councilman.

He was a brother of Drs. Jas. A. and David Waugh, and had a family of three daughters and three grandchildren. His wife died about two years ago. He was also a member of the Pennsylvania Bureau of Animal Industry. Dr. Waugh was planning to retire and recuperate for a year on the Pacific Coast, but the end came suddenly and closed a useful career.

J. A. W.

Dr. Allen E. Cherry died in Denver, Colo., on March 3, 1922, at the age of 32 years. He was born in Russia but came to this country in 1905, graduating from the Veterinary Division of Michigan Agricultural College in 1915. He joined the A. V. M. A. the following year and was a first lieutenant in the World War. At the time of his death he was in the service of the B. A. I., stationed at Denver.

HORSEHAIR FOR HYPODERMIC NEEDLES

Dr. Benjamin A. Daniels, a physician of Tampa, Fla., writes to the *Journal of the American Medical Association* that he has found horsehair (suture clippings) to be more effective than either brass or steel wire for keeping open the lumen of all kinds of hypodermic needles. As they are black, they are readily seen and picked up when wanted for reinsertion into the needles. They never rust, seldom break, and may be sterilized inside and along with the needles.

MISCELLANEOUS

A SUSPICIOUS DISEASE IN JAMAICA

The *Jamaica Gazette* of July 29, 1922, published the report of G. O. Rushie Grey, Veterinary Consultant, Agricultural Department, to the Colonial Secretary, on his investigation of a disease which has recently appeared among cattle in the neighborhood of Montpelier, in the parish of St. James, and later in Westmoreland and Hanover, Jamaica. In his report Dr. Grey states:

> At first it was thought to be foot-and-mouth disease, and the Department of Agriculture was requested to send the Veterinary Consultant to investigate and report.
>
> In accordance with instructions I therefore visited Montpelier on the 18th instant, and readily diagnosed the disease as "necrotic stomatitis and coronitis," that is, inflammation of the mouth and coronary region accompanied by necrosis or death of limited areas of tissue of the affected parts.
>
> In almost every case the first symptom observed is strings of saliva hanging from the mouth, which is usual in practically all inflammatory conditions of the mouth. Later, salivation becomes more profuse; eyes sunken; gradual or sudden loss of condition; tenderness, or even marked lameness of the feet; separation of the horn and skin at the coronary region with bleeding in some cases; sores between the claws; extremities swollen. There may be also sores on the udder. Affected animals cease feeding, stand in one place or lie down, and when they move do so with difficulty. The animals are very "tucked up." Those that do not succumb to the disease begin to show signs of improvement after four or five days.
>
> The preceding is a comprehensive survey of the development of symptoms; some of the symptoms may be very slight, or even absent; but salivation is the constant symptom.
>
> If the mouth is examined in the early stage, little may be seen; later, small patches of the covering membrane of the tongue or gums appear brown here and there; then the membrane comes off in small patches, or over large areas, exposing a reddened but healing surface below. In some cases the separation of the hoof is so extensive that the animal is unable to stand, and if moved about the hoof is liable to be shed.

The report does not show that any inoculation tests were made in diagnosing this outbreak of disease, which from the symptoms described so closely resembles foot-and-mouth disease after the vesicles have ruptured; neither does it show whether any other species of animals are affected. On account of the similarity of the symptoms to foot-and-mouth disease, the Bureau of Animal Industry has issued instructions discontinuing the importation of hides from Jamaica until further orders. Under existing law and regulations it has not been permissible to import cattle from Jamaica since 1890.

HORSE RAISING DECLINES BUT QUALITY IMPROVES

If comparative figures from 14 of the leading horse-producing States can be taken as showing the tendency in all parts of the country, there has been a decrease since 1915 of about 60 per cent in the number of stallions in service in the United States. Grades, cross-breds, and scrubs have been falling behind at a greater rate than the purebreds, the latter decreasing a little less than 50 per cent. These statements are based upon a report, Stallion Enrollment as Related to the Horse-Breeding Situation, just compiled by the United States Department of Agriculture from reports from 18 of the 24 States having stallion-enrollment laws.

There has been a decrease in the total number of stallions and jacks every year since 1915, but the rate of decline slackened somewhat in 1921. Fourteen States having an enrollment of 46,121 stallions in 1915, had only 18,092 in 1921, a decrease of 60.8 per cent. Of the stallions in 18 States in 1921, 74.2 per cent were purebred. In 1915, only 60 per cent were registered sires. As the numbers decrease the quality improves. Farmers are finding that it pays to raise only good horses and mules.

The number of stallions of the light breeds has been decreasing more rapidly than the number of draft stallions. The total of jacks has been increasing gradually until the last year, when there was a slight decrease. There has been a striking increase in the actual number of purebreds. The change in the ratio of jacks to stallions is a fairly accurate measure of the popularity of the mule. Twenty-nine per cent of the total number of stallions and jacks enrolled for public service in 15 States in 1921 were jacks, while in 10 States in 1915 only 9.3 per cent were jacks.

Several States have recently enacted enrollment legislation that should lead to further improvement of breeding stock and the general run of work stock. Pennsylvania and Indiana now permit the use of only purebred stallions and jacks for public service. They also disqualify stallions and jacks that are unsound or of such inferior type or conformation that they may prove a detriment to the horse-breeding interests of these States. Michigan also has passed a similar law that will become operative January 1, 1923.

ST. LOUIS SAYINGS

Among those who motored to St. Louis were Captain and Mrs. R. A. Kelser, Miss Davidson and Evelyn Ray Kelser of Washington, D. C. They covered 1,982 miles on the round trip.

The jovial countenance of Col. C. J. Marshall was missed by his many friends at the convention.

Dr. George H. Hart of California, Dr. Thomas Simms of Oregon and Dr. E. E. Wegner of Washington made the longest journeys of any from the States, but the prizes for real distances should go to Dr. Chas. V. Noback of Colombia, Dr. G. A. Roberts of Brazil and Dr. S. Youngberg of the Philippines.

Dr. and Mrs. Adolph Eichhorn returned from their three-month trip through the various European countries just in time to make connections for the St. Louis meeting. Dr. Eichhorn's vivid descriptions of the professional, social and agricultural conditions noted during his travels were deeply appreciated by all those who had the pleasure of hearing them.

The oculists of St. Louis reported a thriving business on the day following the cabaret entertainment at the Planters Hotel.

Dr. L. A. Merillat's new method of restraint as applied to fillies was to say the least quite unique.

Miss Evelyn Ray Kelser had the distinction of being the youngest dancer at the President's reception on Monday night.

The many friends of Dr. George Hilton, Chairman of the Executive Board, deeply regretted that he was unable to be present on account of protracted illness. The JOURNAL extends him all good wishes for a speedy convalescence.

"Sheriff" Jeffries was unable to make any "arrests" during the convention, although he was observed to be keeping close watch on one of his fellow townsmen.

Drs. E. A. Watson and A. E. Cameron of the Canadian Health

of Animals Branch visited Washington, D. C., on their way back from St. Louis. Dr. Cameron will remain in that city for several months studying the various methods of research employed in the different government laboratories.

Dr. and Mrs. Hamlet Moore of New Orleans, La., started on a trip to the Hawaiian Islands immediately after the St. Louis meeting and will be gone several months.

Dr. C. C. Wang, a graduate of Ames in the class of 1922, was a recent visitor at the Capital, where he spent some time acquainting himself with the work of the B. A. I. before returning to China. Incidentally it is stated that Dr. Wang is the first Chinese graduate veterinarian.

The late Prince Albert of Monaco, who was widely known for his interest and achievements in science as well as for being the ruler of the little principality comprising Monte Carlo, bequeathed to the French Academy of Medicine, of which he was a member, the sum of one million francs, and a like sum to the Academy of Sciences.

MILK LESSONS FROM AMERICA

Dr. Robertson, Medical Officer for Birmingham, England, has been in the United States, in company with Mr. E. W. Langford and Mr. Gurden, representatives of the retail milk distributors of Birmingham, to investigate American methods of supplying milk. He hopes that the American practice of retailing milk in bottles will be introduced in his country. American milk is richer and cleaner than in England, and is pasteurized and cooled. He thinks the cooperative system is well developed in the States, making for economical and speedy marketing, and having also the advantage of central cooling stations. Dr. Robertson advocates the recording of milk yields of individual cows, testing for fat, and the elimination of inferior animals. He points out that American farmers receive a basic price for milk containing 3.5 per cent of fat, and a higher price for a superior grade. The minimum percentage of fat allowable in milk in England is 3 per cent.

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RABIES IN WASHINGTON, D. C.

THE PRESENCE of rabies in the city of Washington was proved scientifically in December, 1892. The disease spread until in the fall of 1895 a fatal case in a woman called attention to the fact that rabies had become prevalent among the dogs of the city and the examination of all suspected cases was undertaken by the Pathological Division of the Bureau of Animal Industry. During the next ten months, beginning September, 1895, eight rabid dogs and two foxes were examined by means of animal inoculation and found capable of transmitting rabies to test animals. As will be seen by the following table, the destruction of the affected animals after their malady had reached the furious stage and they had possibly bitten several other animals did not tend to check the spread of the disease. Accordingly in June, 1907, an order was issued by the District Commissioners which required the muzzling of all dogs running at large in the District of Columbia. It will be interesting to recall something about the issuance of this order. A number of children had been bitten by stray dogs, which fact had been brought to the attention of President Roosevelt, as had also many protests from dog owners and others against the proposal to require muzzles.

Mr. Roosevelt sent for Dr. Mohler, the chief of the Pathological Division, for an interview during the lunch hour. The situation was explained briefly, and the fact that the public schools were to close on the following day for their summer vacation was mentioned incidentally, with the resultant danger especially to school boys who would be roaming the fields and woods about the capital. Immediately the President came to a decision, wheeled swiftly in his chair, reached for the electric button, and summoned his secretary, Mr. Loeb; a letter was dictated at once to the District Commissioners calling their attention to the conditions that existed, and asking immediate action. The Board met at 2 p. m. and issued an order effective the same day, which was published that afternoon in the local papers.

This order resulted in the impounding of almost twice as many dogs, but after a year or so it became customary for dog owners to remove the muzzles and release their dogs as soon as the dog catchers were thought to have ended their work for the day. In August, 1910, a more restrictive order was issued by the Commissioners, the enforcement of which has reduced slowly the number of rabid dogs found, the number of animals impounded, and the number of dogs running at large.

Until the present Board of Commissioners took office muzzles

Year	No. rabid dogs from D. C. examined by B. A. I.	No. licensed by D. C. Tax Collector	No. impounded by health office	Amount tax received D. C.
1904	14	9,216	3,219	$16,773.00
1905	13	9,790	2,656	17,819.00
1906	8	10,116	3,139	18,411.00
1907	12	11,021	3,985	20,059.00
1908	61	10,998	6,694	21,424.00
1909	79	11,215	6,946	21,424.00
1910	58	11,313	4,929	21,489.00
1911	75	10,250	5,531	21,921.00
1912	56	9,061	4,703	20,026.00
1913	52	8,659	3,599	17,589.00
1914	56	8,636	3,768	16,759.00
1915	8	9,141	3,210	15,901.00
1916	7	7,917	2,973	16,637.00
1917	5	8,187	3,257	14,414.00
1918	34	8,808	2,747	14,973.00
1919	35	9,280	2,854	16,031.00
1920	9			16,925.00
1921	12			

The number of dogs licensed as given in the above table is approximated for a portion of the years included, as definite records are not available for a few of the earliest and latest years reported.

were required throughout the year, but in the spring of 1921 the city heads changed the regulation to provide that muzzles would be required only from July 9 to October 9. While the Health Officer recommended that the former ruling requiring muzzles throughout the year be continued, the Commissioners decided that there was little need for covering the mouths of canines during the winter months. This decision of course is based on expediency rather than on any scientific foundation as dogs are just as liable to contract rabies on July 8 as on July 9. However, it is the intention of the present Commissioners to watch results and be guided by them as to further action for the control of stray dogs.

ADDITIONAL ASSOCIATIONS

IS IT professional unrest or an irrevocable necessity which encourages the formation of new veterinary medical associations? Maybe it is not either one; however, there appears to be a tendency to start something new and those with the spirit of enthusiasm are able to advance splendid reasons why new associations should be created. Conversely, another element is able to produce arguments to the contrary and after one has carefully listened to both sides, the situation is still befogged and the mists do not quite clear away. It is a fact that a number of states support more than one veterinary medical society and in a number of instances, a group of states are maintaining an association in addition to their respective state organizations.

Every qualified veterinarian should feel it his first duty to support loyally his home state association and the A. V. M. A. These two should receive first consideration and be given well measured expression before launching any new adventure. We must not forget that the old associations are established and can serve all purposes well if only the members forget *self* and use the organized agencies already developed toward advancing the veterinary profession. Many have grown gray in the service; they have met adversity and suffered defeat, but still they remain loyal and refuse to divide their talents and enthusiasm with any new order.

New associations require liberal financing and veterinarians contemplating their formation are usually members of the

State Association and A. V. M. A. respectively, therefore, as the question of dues and other expenses plays an important part, the temptation is offered to neglect one and to support the other. Whichever way the members goes, his decision is bound to weaken materially the forces of one society. On the other hand, the more veterinary medical associations which become successfully established, the greater advancement the profession will enjoy.

All professions demand the spirit of democracy and will not tolerate, at any cost, a domineering autocratic condition. The minute autocracy appears in an association, the entire system becomes faulty and the framework of the structure stands alone as a gaunt skeleton. This situation obtaining makes men restless because it robs them of their inherent right, notably, to enjoy equal rights. The one great eternal principle of success is to use well what we already have, and mold it into an indestructible force. This being accomplished, would there be any argument against a group of states combining their meeting dates and every three or five years have a joint meeting? Think it over.

If the veterinarians organizing these new associations feel sufficiently enthusiastic and financially able to continue their old obligations, then very little can be said against the undertaking. E. I. S.

THE OLD ORDER CHANGETH

AGRICULTURE'S stupendous tribute paid to insects and plant diseases has for too long been tolerated by a more or less national psychology founded upon the ramshackle premise that these pests are ineradicable and that the best we can hope for is to keep them "under control." We refer only to those for which science has discovered remedies. In most cases those remedies have been applied but half-heartedly because we have held but a half-hearted belief in them.

It called for a daring imagination on the part of General Gorgas to undertake the cleaning up of the Canal Zone and thus so totally to reverse the order of things as to make certain human diseases there merely an unpleasant memory. But he did it.

Many years ago New Orleans put up a monumental fight

to eradicate totally the tiny *Stegomyia fasciata,* the only mosquito which is capable of transmitting yellow fever. Think of hunting down every teacupful of standing water in the labyrinthine vastness of a city and ridding every such breeding place of mosquito life! New Orleans did this.

And yet only recently the doctrine of eradication has begun actively to supplant that of control, in the general scheme of applied entomology, mycology and bacteriology. We are witnessing an absolute facing about of the practical application of science by our Federal Department of Agriculture in such instances as its campaign for eradication—no longer control—of the cattle tick and bovine tuberculosis. The minds directing these efforts now refuse absolutely to tolerate any such compromise as "control measures." Nothing short of total eradication, drastic as may be the means to the end, is their goal.

This in a sense is ephocal. It marks a turning point. Daring as are such conceptions in the face of the time-buttressed tolerance of tick and TB, yet the initiative now taken daily gathers momentum and in due season is sure to set up a national mental reaction. And by virtue of this new it-can-be-done state of mind we shall make an even better job than ever of controlling those pests for which science as yet has discovered no specific.

A malignant offspring of the old psychology has been the brood of parasitically minded humans who would perpetuate a menace and hand down the task of its control as a heritage. Many a crop of political plums has been grown on a national scourge. And by the same token many a campaign of eradication has aborted as a direct result of determination on the part of those charged with the practical details not to "work themselves out of a job." Such beings have always sheltered their derelictions behind the cloak of that established state of mind which feeds on the creed of control but has not dared espouse eradication.

But we have annihilated such intangible things as time and space with the automobile, aeroplane, radio. Then what, in comparison, is the task of annihilating tangible, visible parasites? Nothing! It is half done when we have destroyed the thought that it cannot be done.—*Editorial in the Country Gentleman, July* 15, 1922.

THE TREND OF VETERINARY PRACTICE [1]

By W. H. WELCH
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IF THE APPELLATION of "Doctor" be legitimately extended to include all who minister to those ailing in either body or mind, through "osteopathic," "chiropractic," "hypnotic," "Christian Science," or what not methods, then surely may the practice of veterinary science in its primitive state be claimed to have existed from almost the beginning of time. It has always been an honorable calling, and was so recognized by God himself. Abel, the brother of Cain, was a keeper of sheep, and "the firstlings of his flock were made an offering unto the Lord, and the Lord had respect unto Abel, and unto his offering." Throughout the Holy Writ there is declared a manifest respect for the caretaker of animals, as evidenced by the positions of importance to which David and others were called, while even Christ himself did not despise the appellation of "the Good Shepherd." The Bible also records that epidemic of the "very serious murrain laid upon the cattle, horses, asses, camels, oxen and sheep, belonging to Pharaoh and his hosts," in which the death rate was 100 per cent. Furthermore, we learn that the question of sanitation was a problem in those days, the law of Moses commanding: "The flesh of the bullock, and his skin, and his dung, shalt thou burn with fire without the camp." Again it is recorded that on one great occasion the welfare of the entire animal kingdom was committed unto the care of Noah, and all animals coming under his ministration lived to perpetuate their kind, while all those denied his unequalled hospital facilities perished from the face of the earth.

Coming to our own land and times, the real science of veterinary practice has been developed within the memory of many here present. Some recall quite vividly the old farrier, who knocked out wolf teeth and poulticed the foot with cow manure until the "gravel" worked out. Later he became known as a "horse doctor," because he really "cut colts" for a living, but doctored horses for "their water," "bots," and "lung fever."

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

About this time there was developed the theory that all disease has its origin in the blood, whereupon enters the "veterinary surgeon," whose surgery consisted mainly of bleeding the animal so long as it could stand, and the owner for all that he would stand. Naturally, in the process of this evolution his clientele practically compelled him to undertake the treatment of other domesticated animals, and it was during this period that we learn of the marvelous cures effected among cattle suffering from "wolf in the tail," "hollow horn," or perhaps the highly prized family cow had been so unfortunate as to "lose her cud." The faithful dog also occasionally demanded attention, for "hydrophobia" was a very common disease of those days, and many lives, both human and animal, were saved (?) by the magic of the madstone. Out of all this seething mass of superstition and ignorance, due principally to enlightenment through the agency of schools devoted to the teaching of veterinary science, there has emanated a gentleman bearing the earmarks of being college-bred and known professionally to the world as a veterinarian.

Perhaps the most remarkable change recognizable in veterinary practice is observed in the changed character of the graduate himself. Two or more decades ago few young men were entering the veterinary colleges of our country, while matriculants varying from thirty-five to fifty years of age were very common. Horses were very high in price, and veterinarians were scarce, consequently the crying demand for "horse doctors" echoed from every locality. Indeed, excluding dairy centers, the horse constituted almost the entire practice of both city and country practitioner. Our college courses were of but two years, and while we received a smattering of comparative anatomy, pathology and medicine, the curricula of the different schools dealt mainly with the equine subject, and it would be the rankest of flattery to say that they graduated us as "qualified veterinarians," because they graduated us purely as "horse doctors," and rather poorly qualified at that. There was not time for adequate instruction in all branches in so brief a course, so that we majored in the subjects of "Theory and Practice" and "Materia Medica" at the expense of the balance of the curriculum. We left school solemnly impressd that we had graduated from the greatest institution of its kind, and that there was but little more, if any, to be learned.

Sadly enough, many a graduate of that period never found out differently, for immediately upon completion of his course he jumped at once into a lucrative practice, and he was so much better than the empiric whom he supplanted that he was given a much higher rating than he really deserved. There were comparatively few graduates in those days, and small wonder that many of these should absorb some of the unethical tactics of his empirical opponent, and later on hesitate to become on friendly terms with a younger graduate and decline to mingle with his professional brethren in the meetings of the association. The empiric had taught him to guard zealously any superior methods or knowledge of which he might become possessed, else his competitor would profit thereby.

Then came the great financial depression, wherein horses possessed but slight value, and practice went "blooey." Many left the profession, and those who stayed in lost interest in their practice, finally getting into a rut from which they have never extracted themselves. They read practically no literature, never attend an association meeting, nor have aught to do with their fellow practitioners. They make no progress, and might very properly be christened hermits who have lost out on the most beautiful and valuable part of their life, the companionship and fellowship of their professional brethren.

How different the graduate of later years, who, with his preliminary high-school education as a foundation, and his very complete four years of veterinary instruction, lacks only experience and adaptation to make of him a truly qualified veterinarian. He enters a field pervaded by a different atmosphere. He is no longer just a "horse doctor," but is the confidential adviser of the livestock owner concerning all the domesticated animals on the farm. It is his function to keep them well as certainly as it is to treat the ailing, while as a sanitarian he is no less valuable than the physician in guarding the health of his client's family. He is the leader in bacteriology, pathology and other fields of original research, while as inspector of foods his services are indispensable. He is the cultured professional gentleman who without jealousy is daily rubbing shoulders with his competitor, both at home and at the various association meetings. To the livestock owner he is indispensable, and he is one of the community's greatest assets.

The past two decades have witnessed a wonderful change in

the character of veterinary practice itself. The city veterinarian first noticed it when his cat and dog practice began to increase, while his equine patients gradually became less numerous. The automobile displaced first the high acting and popular coach horse, and gradually the truck made great inroads on the heavy draft animal. With the demand for horses lessened, the country soon began to cease breeding, and since a large percentage of the country veterinarian's practice is with the young, growing animal, equine practice became much less. But the family cow came into her own, and was as highly prized as had ever been the family horse of old.

Then occurred the most important discovery that our profession has ever known, when from our Bureau of Animal Industry came the important announcement that the dreaded scourge of hog cholera, that periodically swept the "mortgage lifter" from the earth, could be prevented, as the animal could be successfully immunized. Placing as it did the swine industry on a safe financial basis, its value to the entire world can not be estimated, while the hog, hitherto almost entirely ignored by schools and veterinarians alike, strangely enough now becomes one of the profession's greatest assets.

Previous to the development of the present method of immunization cholera was considered about the only serious affliction of the porcine race, and practically no attention was devoted to swine diseases by our schools, the original research departments, or by veterinarians in general. With the advent of immunization, therefore, it was but natural that disaster should sometimes follow work in the field, even though conducted by veterinarians well versed in all phases of practice as it pertains to all animals other than the hog. For the past few years, however, much time and study have been devoted to swine diseases by all interested persons, and the veterinarian, daily becoming more proficient in the diagnosis and handling of porcine troubles, is demonstrating to all unprejudiced minds that it is on him that the swine owner must depend to guard successfully the health of this vast industry. The swine industry of today is on a practically safe financial basis for the first time in its history, and has been placed there solely by reason of the efforts of the veterinary profession.

There are still problems concerning the hog, and in the hands of the veterinarian alone rests their solution. That the county

agent or anyone else who imagines himself capable of rendering intelligent service along this line, by exploiting vaccination in the hands of other than the veterinarian, is, in his gross ignorance, perpetrating a great injustice on the hog, the hog owner, the veterinarian, the county which employs him, as well as on the nations at large which his methods will eventually deprive of much pork, is a self-evident fact. The farmer attempts vaccination purely as an economic measure. He has possessed an exaggerated idea of the amount of profit that the veterinarian was receiving from hog vaccination, while on the other hand the veterinarian on his part resented any inquiry into that matter on the part of the farmer. Unscrupulous serum companies, having regard only for their own income, and with no serious concern as to the ultimate effect of such a policy, paved the way for farmer vaccination, by making a bid for the serum business of the county farm bureaus. They were not sufficiently far-sighted business men, or they should have seen the ultimate downfall in reputation of their serum in hands of the incompetent novice. The farmer himself freely admits the superiority of the veterinarian in vaccination, but because he has been led to believe that he can successfully perform it, only time and experience will teach him the lesson that the veterinarian is the cheaper in the end. When he discovers this, as he certainly will do, he will return to the veterinarian, and will have nothing but condemnation for the county agent who in his ignorance has led him astray.

When the farmer and the veterinarian come into a mutual understanding of this subject the matter can be amicably adjusted. This can be accomplished in most instances through the county veterinary association, in conjunction with the county farm bureau, and constitutes one of the strongest pleas for the organization of veterinarians by counties throughout our nation. The interests of the livestock owner and the veterinarian are identically the same, and the closer they become united the better for each. Farmer vaccination can not last, because in time it is certain to be followed by disaster. Moreover it not only weakens the control of our sanitary authorities on a very serious contagious disease, but it is a problem that is very intimately associated with the meat supply of our nation, and as such should be absolutely prohibited.

An interesting and profitable feature of practice today, and

one that is certain to increase greatly, is shown by the frequency with which we are called upon to prescribe for poultry. Those who have had the benefit of instruction on this subject during their college career, or have otherwise prepared themselves for this phase of practice, will readily testify to its importance from a financial standpoint. The farm flock during the past few years has been one of the best paying propositions of the farming industry, and greater care is being given them than ever before. The increase in the number of purebred flocks is remarkable, and the bird valued at from $5 to $25 is encountered with wonderful frequency. When one has demonstrated his ability to cope intelligently with the problems of the poultry raiser, he renders a service that is adequately appreciated by all members of the family, and one from which he will probably receive more advertising of a favorable character than he would obtain in any other manner. It is a branch of our profession that has been too long neglected, both by the veterinarian and by our schools, and promises to play no small part in the future success of the progressive veterinarian.

The "accredited herd" work instituted by the Bureau of Animal Industry promises to add slightly to the income of the "accredited veterinarian." Without doubt, the purebred herd and dairy herds that are furnishing milk to municipalities requiring such test will continue to be maintained as "accredited herds," while county units of "tuberculosis-free areas" are certain to be the popular method of extending this work just as soon as we have sufficiently recovered from the financial depression from which we are emerging. However, until this work is taken up as a county or township measure, I should not be surprised to learn that the owner of a grade herd will remain perfectly contented in the knowledge that his herd has been pronounced free from tuberculosis by the requisite number of official Federal tests, and unless new animals are added, or a tuberculosis-free area is established, that he should cease testing his animals. Let us encourage the good work among our clientele with the hope that ultimately our townships and county may be placed on the free area list.

I feel that there is a future belonging to the veterinarian in the position as county livestock adviser. Who more capable than he in advising along all lines of animal husbandry, sanitary problems, and all phases of livestock production? The

time is coming when throughout the entire livestock belt such a man will be employed in a majority of the counties, and he will be a wonderful asset in the improvement of livestock in his locality.

I can not close the subject assigned me without criticising a lamentable habit that is fast developing among our practitioners, of purchasing from their drug houses a line of proprietary specialties, instead of compounding their own remedies for each individual case. Indeed, the entire medical profession may be said to be degenerating into a state of educated quackery along this line. The office of the average physician is today filled, not with fluid extracts and tinctures, etc., as of yore, but from top to bottom the bottles are labeled "Rheumatic Remedy," "Diuretic," "Uterine Tonic," "Chologogue," etc., and the veterinarian is fast following in the same footsteps. Ask the majority of those who have become addicted to this habit what the preparation contains that he has just administered to an animal, and 75 per cent of them can not name all the ingredients, much less the proportion of each drug per dose. The oily-tongued salesman explains how much better his firm can compound these remedies than can the veterinarian, and impresses on your mind how thoroughly ethical they are, since each drug and the amount of each is plainly stated on the bottle. While all this may be perfectly true, I have known as dangerous a drug as barium chlorid to be camouflaged under the guise of "other saline purgatives."

The practitioner who allows himself to become addicted to this custom is fast losing out on his knowledge of medicine, instead of coming to know a drug more thoroughly in its action. He will in time become merely a mechanical automaton, and the stock owner who is able to diagnose his animals' trouble will fare equally as well by going to the drug store and purchasing over the counter the remedy that has been compounded by some other firm for that particular ailment. And who can blame him? For he is perhaps receiving just as good treatment for his animal as his local veterinarian was dealing out to him. The empiric has always treated his patients by just this process. He has his favorite prescription for each disease, and if that one does not "cure" the animal he tries another prescription. Let us steer clear of this practice and avoid shotgun prescriptions, so that when we administer a drug we may

realize when we obtain the expected result, and instead of being an actual menace to our patrons we will prove a positive benefit.

The public is today demanding better service of the veterinarian than ever before, and never was efficient service better appreciated. Your best patron of today is not the man who has no knowledge of animals, but on the contrary he is the agricultural graduate who is fairly well versed in all lines of animal husbandry. It is not sufficient that the veterinarian of the future be able to treat sick animals intelligently, but he must be more thoroughly grounded in the very fundamentals of the profession, as they relate to animal husbandry, sanitation, etc., so that he is capable of advising along all problems connected with the care and handling of livestock. The progressive veterinarian of today is one of the real assets and blessings of his community, and practice in the future will progress or decline with us in proportion to the skill that we display. Our profession of today is, I believe, as successful as is the medical profession in treating and preventing disease. On the question of eugenics we are far in advance of them, as we have legislated our defectives out of business, while the medical profession still permit their syphilities and imbeciles to perpetuate their kind.

Our work goes hand in hand with the county farm organizations, and instead of antagonizing them in a fight in which we should fare second best, let us prove our ability to lend intelligent aid to their problems, to the mutual advantage of each. Our future is what we make it. Let us prepare ourselves for our work, and the work will be prepared for us.

The Technical Committee of the Milk League of France has adopted the following resolution:

"In view of false interpretations published with regard to the recent communication of Prof. Calmette to the Academy of Medicine, on 'Tuberculosis in Milk Cows,' interpretations of a nature to spread wrongly in the public mind the conviction that children may consume without danger the raw milk of cows which react to tuberculin, the Milk League asks that it be clearly specified that cows whose milk is intended for human food should be submitted to the tuberculin test at regular intervals, and that the milk of those which have reacted should not be consumed except after boiling."

INVESTIGATIONS ON THE IMMUNOLOGY OF SWINE PLAGUE [1]

By R. R. Birch *and* J. W. Benner

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IT IS IMPORTANT for veterinary practitioners and their clients to learn the true value of biological products which are daily brought to their attention in advertisements. Numerous inquiries come to us concerning the value of swine-plague vaccines and bacterins. We conduct a swine practice as a part of the ambulatory clinic of the New York State Veterinary College and it is our desire to obtain first-hand information for the benefit of our students and our clients. Moreover, there are points concerning important phases such as cause, character and occurrence of this disease which are still hazy and under controversy.

In 1919 we decided to begin with the very fundamentals of swine plague and to continue the work until experimental data should enable us to take an intelligent stand for or against biological products claimed to be very valuable prophylactic and curative agents for this disease. We have confined our experiments as much as possible to swine in order to eliminate what seems to us a grave mistake, namely, experimenting with rabbits and guinea-pigs and trying to apply the results to swine.

We are continuing our work, hoping to find some effective immunizing agent, so this paper must assume the nature of a report of progress. Our data, though incomplete, are sufficient to indicate very clearly the results which may be expected from certain immunizing agents. All investigators do not draw the same conclusions from like data, but our results to date are submitted in the hope of aiding those who have been perplexed by the problem of immunizing against swine plague.

From our previous work with *Bacterium suisepticum* we believe we have sufficient evidence to warrant the following statements:

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922

1. That *Bacterium suisepticum* is the specific cause of a swine disease called swine plague or hemorraghic septicemia of swine.

2. That swine plague occurs sporadically as a well-defined disease without complications, but that its most common occurrence is in a complicated form.

3. That death can not be caused by subcutaneous injections of live, unattenuated organisms with any regularity or precision.

4. That intravenous injections of 1 mil of a heavy suspension of the unattenuated organism regularly kills or disables pigs under eight weeks of age and the same dose frequently kills or disables older pigs.

5. That pigs artificially inoculated with intravenous injections of a suspension are inclined to show joint lesions which are not commonly observed in naturally infected cases.

6. That pigs closely confined in pens with animals artificially infected may very rarely contract the disease.

7. That in swine killed by a suspension of *Bacterium suisepticum* given intravenously, the blood may or may not contain the organism, depending on the grade of immunity of the animal.

We have seen *Bacterium suisepticum* manifest its harmful effects on swine in a number of different ways. We are giving the various forms of swine plague as we have seen them, noting under each form the manner in which it was produced and its predominating characteristics. The forms are not always separate and distinct. We have seen two or more in the same animal, but each form will be described briefly because a different character appeared to predominate in causing either the disability or death of the animal.

1. A general septicemia which may occur in peracute form, the animal dying in 48 hours; in an acute form, the animal dying in 5 or 6 days; or a chronic form, the animal living for 20 to 25 days, then either dying or recovering.

In all three of these variations we have recovered the organisms from the blood of dead animals by the inoculation of agar slants and the injection of small quantities of heart's blood into rabbits. We have seen the peracute and acute septicemias follow intravenous injections of heavy suspensions and the chronic septicemia in two of our check pigs that contracted the disease by close contact with pigs which we had infected artificially.

2. What appears to be a toxic form, occurring peracutely and

causing death in 48 hours. The blood of swine dying of this form is sterile, as proved by culturing and rabbit inoculations, thus differing strikingly from the septicemic forms just described.

We consider this form as especially significant from a diagnostic standpoint, for it is evident that when it occurs in animals sent from the field to the laboratory for diagnosis the cause of death is very apt to remain a mystery when the blood is found to be sterile. If the bacteriological examination is somewhat delayed, as frequently happens in field cases, and such organisms as *Bacillus coli,* streptococci, etc., pass from the intestinal tract to the blood, the findings may be misinterpreted and give rise to numerous and varied pseudo-causes of disease and death of swine.

Our only explanation for this so-called toxic form of swine plague may be based on the theories of immunity, *i. e.,* that the protective forces of the body, antibodies (Ehrlich) and phagocytes (Metchnikoff) have been increased to such an extent that they completely destroy the organisms and in this rapid destruction enough endotoxin is liberated to kill the animal. The animal body in these cases can overcome the bacteria but it can not withstand the toxin liberated. From certain descriptions of cases of hemorrhagic septicemia in cattle recently brought to our notice, we believe that possibly this same phenomenon occurs in that species.

3. A joint form which usually follows in 24 to 48 hours after an intravenous injection which is not sufficiently large to kill the animal. The infection localizes in the joints, especially the knees and hocks, causing disease ranging from a slight limp to complete and permanent disability. The pig may lie for weeks unable to rise but will eat regularly if helped to food. The temperature and respiration remain normal. As a rule we have killed these animals after two or three weeks to terminate their helpless condition. The blood has been found sterile but the exudate in the joints invariably contains the organism. In the septicemic forms we have frequently seen a tendency toward localization.

Newsom and Cross have noted lameness in sheep caused by intravenous injection of *Bacterium ovisepticum,* while Murray and McNut, in a recently published article on "The Tendency of Organisms of the Pasteurella Group to Localize," cite this tend-

ency in various species of domestic animals after organisms of the pasteurella or hemorrhagic septicemia group have been used upon them.

4. The pulmonary or pectoral form, which is more or less chronic. This is the form usually described in standard textbooks and is thought of as most typical of natural infection. This form occurred in two of our check pigs which were kept closely confined with four others that had been given intravenous injections of *Bacterium suisepticum*. These two checks became sick the third day; one was sick for 20 days and recovered; the other was sick 25 days and died. The pig that died showed a typical swine-plague pneumonia as described by good authorities and had the organism in its blood, as was demonstrated on culture media and by inoculations of rabbits with a small quantity of heart's blood.

5. A localized form in which abscesses formed at the point where live unattenuated organisms were injected. Such abscesses enlarge for three or four weeks and remain almost indefinitely. They consist of a mass of pus completely encapsulated by connective tissue. Upon killing these animals we have found the blood sterile but the contents of the abscesses teeming with the swine-plague organism.

By subcutaneous injection of our most virulent strain, the virulence tested on rabbits, we have not been able to kill or seriously injure strong, healthy pigs with any regularity or precision. Local abscesses occurred and there was a stunting effect, but death was the exception rather than the rule. We have therefore vaccinated by injecting pigs subcutaneously with unattenuated organisms and tested the immunity thus conferred by intravenous injections of similar virus. The vaccine used was a physiological salt suspension of *Bacterium suisepticum* made by washing the growth from agar slants incubated from 16 to 20 hours at 37 degrees C. The suspensions used for the trial injections were prepared in the same way.

The suspension for each vaccination was tested on rabbits, and for the trial injection, in addition to the rabbit test, a nonvaccinated pig was given the same dose in order to compare the effects on vaccinated and unvaccinated pigs.

As the work which we have done to determine the pathogenic significance of *Bacterium suisepticum*, together with two of our immunizing experiments, has been published in detail in the

1920-1921 report of the New York State Veterinary College, we have summarized the results of our previous investigations and will in this paper attempt to describe briefly an immunizing experiment which is typical of the regularities and irregularities that one may expect from the microorganism in question.

From our former immunizing experiments we have evidence that subcutaneous injections of unattenuated organisms will not confer a solid immunity against subsequent intravenous injections. But we have had indications that a certain grade of immunity may be conferred by this method of administration. The purpose of the following experiment was to study further the grade of immunity which might be produced with a vaccine.

The experiment was begun on a group of twelve pigs representing two litters, seven from one litter and five from another. All were confined in the same pen throughout the experiment. These pigs were about six weeks of age when the first injection was made December 10, 1921. All were of grade Chester White breeding. The seven had not been so well nourished as the five of the other litter. The former averaged 15 to 20 pounds each and will be termed "the smaller pigs"; the latter weighed from 25 to 30 pounds each and will be refered to as "the larger

Table 1.

Pig No. [1]	Vaccination 1.	Vaccination 2.	Trial Injection	Trial Injection
	Subcutaneous, Dec. 16, 1921	Subcutaneous, Dec. 23, 1921	Intravenous, Jan. 3, 1922	Results
70 S. P....	Dec. 10, '21, 1 mil intravenously. Dead Dec. 12, 1921.			
71 S. P....	1 mil.....	3 mils.....	1 mil.....	Slight general stiffness.
72 S. P....	2 mils.....	....do.....	....do.....	Very slight general stiffness.
73 S. P....	.....	1 mil.....	....do.....	Dullness, inappetence, weakness, chilling. Lameness in left front leg.
74 L. P....	2 mils.....	5 mils.....	....do.....	Slight general stiffness.
75 L. P....	....do.....	....do.....	....do.....	Very marked general stiffness.
76 L. P....	....do.....	....do.....	....do.....	Very slight general stiffness.
77 L. P....	.....	.....	Jan.1,1922, 1 mil.	Found dead 64 hours after injection.
78 S. P....	.....	.....	Jan.3,1922, 1 mil.	Complete and permanent disability.
79 S. P....	Control....	Control....	Control....	
80 L. P....	....do.....	....do.....	....do.....	

[1] S. P. denotes smaller pigs; L. P., larger pigs.

pigs." All were in healthy, vigorous condition and had not been immunized against hog cholera.

Table 1 shows the vaccination experiment with details of each case omitted, and results from the trial injection only.

The effects of the intravenous injection on the vaccinated animals lasted for about a week and were followed by a gradual recovery.

It will be noticed in Table 1 that only eleven animals are accounted for, while in the original group there were twelve. On January 21 one pig of the group which had been kept as a control met accidental death and therefore has not been given a record number.

It was evident from the trial injection of January 3, 1922, that a certain grade of immunity had been produced by the vaccinations and that this immunity was in more or less direct proportion to the quantity of suspension of *Bacterium suisepticum* which had been administered.

ANTI-SWINE-PLAGUE SERUM

Experimentation on the animals of this group was continued by administering larger intravenous doses of the suspension of *Bacterium suisepticum*. This was done to test further the grade of immunity present in the various individuals of the group, to learn more about the influence of dosage on the grade of immunity conferred, and also to learn whether they could be hyperimmunized against swine plague to the point where they would produce a potent serum against the infection.

The suspensions used in the following operations were made and tested in the same manner as were those in the vaccination experiment just given. The details are again omitted for the sake of brevity.

The animals that had been used in the vaccination experiment had recovered from the trial injection of January 3 and seemed practically normal on February 7 when this experiment upon them was begun.

Pig No. 79 in Table 2 was used to compare the action of this sized dose on an untreated pig with treated pigs.

It will be seen that the grade of immunity demonstrated by the smaller pigs is in almost direct proportion to the quantity of suspension they received in previous treatments, while in the larger pigs this is not true. Pig No. 73, receiving only 1 mil

Table 2.

Pig. No.[1]	Date.	Intravenous Injection.	Results.
79 S. P.....	Feb. 7, 1922..	2 mils.....	Found dead in 16 hours. General septicemia.
71 S. P.....	....do.....	....do.....	In 20 minutes vomited. Feb. 7–14, droopy, weak, ate little. Feb. 14–28, recovered.
72 S. P.....	....do.....	....do.....	Slight stiffness and slight serous discharge from the eyes. Affected markedly less than pig No. 71.
73 S. P.....	....do.....	....do.....	Found dead in 16 hours. Blood sterile.
74 L. P.....	Feb. 8, 1922...	....do.....	Feb. 8–15, very stiff. Inappetence. Slowly recovered.
75 L. P.....	....do.....	....do.....	Do.
76 L. P.....	....do.....	....do.....	Slight stiffness. Rapid recovery.
80 L. P.....	....do.....	....do.....	Very slight stiffness Rapid recovery.

[1] S. P. denotes smaller pigs; L. P., larger pigs.

of the vaccine and 1 mil intravenously in the trial injection, was found dead in the same length of time as pig No. 79 which had received no previous treatment. This indicated a low grade of immunity, if any, conferred by the treatment given No. 73.

One of the surprising irregularities occurred among the larger pigs. No 80 received no previous treatment but showed less injurious effects than did those that received previous treatments. It seems that this pig had more resistance as a result of good care and no treatment than did the pigs which had been given the same care plus treatment.

This experience with pig No. 80 led us to believe that for the production of anti-swine-plague serum it would be better to take older, well-nourished hogs and start the hyperimmunizing process with a larger dose of suspension than to take pigs, as we did in the above experiment, and try to build up an immunity by increasing doses. However, we wished to see if we could still increase the dose of suspension in the hyperimmunizing process and not kill our pigs. So on February 28, when the pigs seemed to have recovered from the bad effects of the treatment received February 7 and 8, another treatment was administered as shown in Table 3. We used only part of the group, fearing that we might kill all the animals used.

Again pig No. 80, which had received only one previous treatment (2 mils February 8), withstood the increased dose of 3 mils much better than did Nos. 71 and 74 which had been given two subcutaneous and two intravenous injections previously.

No. 81 was about the same age as the "larger pigs" in the experiment (actual weight 72 pounds), but had not been treated before nor kept in the same pen with treated pigs. Since No. 80 had withstood a 2 mil intravenous dose on February 8 without previous treatment, we thought possibly No. 81 might withstand the 3 mil dose on February 28, but such was not the case. The deadly effect on pig No. 81, when compared with the effects on the other pigs, gave us at least a little information on the grade of immunity we had in the various individuals of this group and showed us also that 3 mils could not be used as the initial dose in pigs of this age.

TABLE 3.

Pig No.[1]	Date	Intravenous Injection	Results.
71 S. P.....	Feb. 28, 1922..	3 mils.....	Immediate collapse. Feb. 28–Mar. 11, inappetence, weakness, emaciation. Mar. 11–May 1, became normal but was undersize.
74 L. P.....	....do.....	....do.....	Found dead in 20 hours. Blood sterile.
80 L. P.....	....do.....	....do.....	Mar. 1, stiff and weak. Mar. 1–6, improving. Mar. 13, normal.
81.....	....do.....	....do.....	Found dead in 5 hours.

[1] S. P. denotes smaller pigs; L. P., larger pigs.

A serological test on rabbits was planned as a means of determining more accurately the grade of immunity present in these pigs, and the application was broadened to test other hog sera as well.

On March 14, 1922, the animals surviving the treatments just described were bled. The operations on this date were carried out in the same manner as in our anti-hog-cholera serum production, *i. e.*, the pigs were bled from the tails in vacuum, the blood defibrinated by shaking, then strained, bottled and preserved with 10 per cent of a 5 per cent solution of carbolic acid.

The serum from pigs Nos. 72, 75 and 76 was mixed and constituted one serum lot in the test. As has been seen in the tables, these pigs received practically the same quantity of suspension in proportion to their body weight. The serum from pig No. 80 constituted a second serum lot and was tested separately because the treatment this individual received differed markedly from that given Nos. 72, 75 and 76. Serum from pig No. 71 should have constituted another lot, but this pig was in such bad condition from his 3 mil intravenous injection of February 28 that he could not be bled.

A third lot of serum tested was bled from four normal shoats susceptible to hog cholera and about the same size and age as pigs Nos. 75, 76 and 80. For the fourth lot we used a bottle of our regular anti-hog-cholera serum.

Table 4.—Serum Tests on Rabbits.

Rabbit No.	Serum, Mar. 14, 1922	Bacterium Suisepticum in Dilution (1-400), Mar. 17, 1922	Results.
144	10 mils, anti-swine-plague serum from pigs 72, 75, 76.	1 mil.....	Found dead in 138 hours. General septicemia.
145	....do.....	....do.....	Do.
146	10 mils anti-swine-plague serum from pig 80.	1 mil.....	Found dead in 144½ hours. General septicemia.
147	....do.....	....do.....	Do.
148	10 mils normal serum from pigs 82, 83, 84, 85.	1 mil.....	Found dead in 16¾ hours. General septicemia.
149	....do.....	....do.....	Do.
150	10 mils anti-hog-cholera serum, series W stock serum.	1 mil.....	Found dead in 19½ hours. General septicemia.
151	....do.....	....do.....	Found dead in 23 hours. General septicemia.
152 [1]	.....	1 mil.....	Found dead in 16¾ hours. General septicemia.
153 [1]	.....	....do.....	Do.

[1] Check on virulence of dilution of Bacterium suisepticum.

Table 5.—Agglutination Test.

Pig No.	1–100	1–200	1–500	Check
82	++	–	–	–
83	++	–	–	–
84	+	–	–	–
85	+	–	–	–
72	+++[1]	+	–	–
75	+++	++	+	–
76	+++	+++	+++	–
80	+++	+++	+++	–

[1] Complete agglutination.

The normal serum and anti-hog-cholera serum were used because of slight indications that hogs as they advance in age acquire an immunity to the swine-plague organism. We have not, however, compared different ages by regulating our dosage to pounds live weight. If hogs do acquire an immunity as they advance in age, then the normal serum used in this test should show a certain degree of protective power and the stock anti-hog-cholera serum should prove still richer in swine-plague anti-

bodies, as our hog-cholera serum is always made from hogs more advanced in age than the animals bled for normal serum in this test.

As rabbits are so very susceptible to the swine-plague organism, we chose this species for the test given briefly in Table 4.

The results of these tests indicate that the blood from the animals hyperimmunized against swine plague had strikingly more protective power than normal serum and the anti-hog-cholera serum.

In the rabbit test, even though the normal serum rabbits and the checks were found dead at the same time, we think perhaps the normal serum had a slight protective power, since the bodies of these two rabbits were still warm and the checks were cold, showing that the checks had died first.

Again, the normal serum from the younger animals showed less protective power than the hog-cholera serum which was made from older animals. The agglutination test may prove valuable in measuring immunity. Both tests must be repeated before a rule can be made.

As the anti-swine-plague serum used thus far had been produced from animals susceptible to hog cholera, we next attempted to hyperimmunize hogs against both diseases to produce if possible a combination anti-hog-cholera and anti-swine-plague serum.

Pig No. 87 was one out of three that withstood the 2 mil intravenous injection. No 89 was one out of two that withstood the 1 mil intravenous injection. We then attempted a different method of administering the swine-plague suspension which seemed to be less hazardous to the life and health of the animal than the intravenous method, that is, of giving a large dose into the axillary space.

According to our rabbit test, the serum from pigs Nos. 90 and 92, receiving the intra-axillary injection, was not as high in protective power as that from pig No. 89, which had received 1 mil of the swine-plague suspension intravenously one week after the hyperimmunizing against hog cholera, but it was higher than that of pig No. 87, which had received a 2 mil intravenous injection of swine-plague suspension three days after the hyperimmunizing against hog cholera. The rabbit test shows also that the serum from pigs Nos. 90 and 92 had five times more protective power than it did before the swine-plague in-

TABLE 6.—HOG CHOLERA AND SWINE PLAGUE HYPERIMMUNES WITH RABBIT TEST.

Pig No.	Hog-cholera virus, intravenous	Swine plague suspension	Results.	Rabbit No.	Dose of serum, June 23, 1922	Dose of Bacterium suisepticum, June 26, 1922	Rabbits found dead
86	Apr. 14, 1922, 590 mils...	Apr. 14, 1922, 2 mils.....	Found dead in 42 hours. General septicemia.	.....	.....	.....	.....
87	Apr. 14, 1922, 610 mils...	Apr. 17, 1922, 2 mils.....	Apr. 18–29, badly crippled. Apr. 29–May 5, became normal.	172	10 mils.....	1 mil.....	70 hours.
				173	.....do.....	.....do.....	93 hours.
88	Apr. 14, 1922, 600 mils...	Apr. 17, 1922, 2 mils.....	Found dead in 18 hours. Blood sterile.	.....	.....	.....	.....
89	Apr. 25, 1922, 525 mils...	May 2, 1922, 1 mil.....	Badly crippled. May 23, about normal.	174	10 mils.....	1 mil.....	147½ hours.
				175	....do.....	.....do.....	120½ hours.
91	Apr. 25, 1922, 640 mils...	May 2, 1922, 1 mil.....	Found dead in 17½ hours. General septicemia.	.....	.....	.....	.....
90	Apr. 25, 1922, 610 mils...	Tail bleeding of May 10 before the injection of Swine plague organism.		178	10 mils.....	1 mil.....	20½ hours.
				179	.....do.....	.....do.....	Do.
92	Apr. 25, 1922, 500 mils...	.....do.....		180	.....do.....	.....do.....	Do.
				181	.....do.....	.....do.....	Do.
90	.....	May 10, 1922, intra-axillary injection of 20 mils.	Tail bleedings after injection of swine-plague suspension.	176	.....do.....	.....do.....	100 hours.
92	.....			177	.....do.....	.....do.....	117 hours.
.....	.....	.....	.....	184	.....	.....do.....	20½ hours.
.....	.....	.....	.....	185	.....	.....do.....	Do.
.....	.....	.....	.....	186	.....	.....	Remained healthy.
.....	.....	.....	.....	187	.....	.....	Remained healthy.

jection. We therefore decided to test the serum from these two pigs, and devised a combination test which would test the anti-hog-cholera properties of the serum and the anti-swine-plague properties as well.

The first tail bleeding for immune serum was made on Nos. 90 and 92 three weeks after the swine-plague injection of 20 mils. They were bled four times at one-week intervals. A composite sample composed of 25 mils from each bleeding was used in the combination test given in Table 7.

TABLE 7.—COMBINATION ANTI-HOG-CHOLERA AND ANTI-SWINE-PLAGUE SERUM TESTS ON PIGS

Pig No.	Anti-hog-cholera and anti-swine plague serum, July 6, 1922	Hog cholera virus, July 6, 1922	Suspension of bacterium suisepticum, intravenous, July 16, 1922	Results
193 (1)	10 mils.....	2 mils.....	.....	July 9–16, sick, recovered.
194 (2)	.....do.....	.....do.....	.....	July 9–20, sick, died.
195 (3)	15 mils.....	.....do.....	.....	No sickness.
196 (4)	.....do.....	.....do.....	.....	Do.
197 (5)	20 mils.....	.....do.....	1 mil.....	July 17–23, sick, died, General septicemia.
198 (6)	.....do.....	.....do.....	.....do.....	July 17–Aug. 18, sick, recovered slowly.
199 (7)	.....	.....do.....	.....	July 12 sick with hog cholera. killed.
200 (8)	.....	.....do.....	.....	Do.
201 (9)	10 mils anti-hog cholera serum.	.....	1 mil.....	July 17–20, completely disabled. Died. General septicemia.
202 (10)	.....do.....	.....	.....do.....	Found dead in 20 hours. General septicemia.
203 (11)	July 13, 1922, 20 mils.	.....	.....do.....	July 17–Aug. 8, sick, recovered.
204 (12)	.....do.....	.....	.....do.....	July 17–Aug. 7, sick, recovered.

The pigs used in the combination test were about ten weeks old and weighed from 35 to 40 pounds. The anti-hog-cholera properties of the serum were considered of the greater importance, and the first ten days of the test was a straight eight-pig anti-hog-cholera serum test. Two other susceptible pigs, Nos. 201 and 202, were placed in the same pen on the same date, July 6, to be used in the swine plague part of the test which was begun ten days later. As they were to be used to check the virulence of the swine-plague suspension on July 16, they had to be protected against hog cholera without being immunized against swine plague. In order to do this, when placing them

in the pen with the eight pigs of the anti-hog-cholera serum test we gave them 10 mils of stock anti-hog-cholera serum which in the previous rabbit test (see Table 4) had shown no appreciable protective properties against swine plague. On July 13, three days before we began the swine plague part of the test, two more pigs, Nos. 203 and 204, were given 20 mils of the combination serum and placed in the same pen. At the end of the ten days we were certain that the serum had the necessary anti-hog-cholera properties, although our 10 mil pigs (Nos. 193 and 194) were sick. After the test was begun we found that the pigs were badly infested with ascarids.

On July 16 the intravenous injections of 1 mil of suspension of *Bacterium suisepticum* were made to test the anti-swine-plague properties of the serum. Six pigs were used for this purpose; pigs Nos. 197 and 198, which were the 20 mil pigs that had gone through the anti-hog-cholera part of the test pigs Nos. 203 and 204, which had received 20 mils of the combination serum three days before but had not gone through the anti-hog-cholera part of the test and therefore had received no hog-cholera virus (as had 197 and 198), and the two pigs, Nos. 201 and 202, which had been protected against hog cholera with a small dose of stock anti-hog-cholera serum but had received none of the combination serum. The last two pigs mentioned were used to test the virulence of the suspension of *Bacterium suisepticum.*

The results as described in Table 7 indicate that the combination serum had some degree of protective power against *Bacterium suisepticum,* but the difference in effect of the 1 mil dose of bacterial suspension on the four pigs which had received the serum and the two pigs which had not was not striking. The ascarid infestation in this group of pigs was no doubt a factor influencing the effects observed, but until further tests are made the value of a serum of this nature will remain uncertain.

When we turn to the practical application of vaccines we are at once confronted with the fact that subcutaneous injections of large doses of highly virulent cultures of *Bacterium suisepticum* will produce only an uncertain immunity, and this at some risk of killing, disabling or stunting the pigs we wish to protect.

There can be no doubt that large subcutaneous doses of sus-

pensions of the organism at times produce a marked degree of immunity to subsequent intravenous injections of like suspensions. Any person who could have witnessed the results of the trial injection described in Table 1 would have been convinced of that. On the morning following the trial injection the difference between immunized pigs and checks was so striking that it could well have been likened to the "break" in a hog-cholera-serum test. But side by side with this seemingly encouraging result we have the fact that pigs that have not been immunized will sometimes show resistance equal to that of those that have been, and in the individual instance cited we must keep in mind the fact that five weeks after the trial injection one of these same pigs succumbed to intravenous injections of *Bacterium suisepticum*.

The fact that swine plague is rarely if ever a rapidly transmissible disease of farm hogs precludes the necessity for routine immunization. Thus all attempts to immunize against the disease fall in the category of emergency work, and with conceivable exceptions, which are rarely met in actual practice, we must administer the product we use to hogs already low in resistance or to those about to be subjected to devitalizing influences. Under such circumstances a virulent culture is not to be thought of, leaving a choice between attenuated or killed cultures. Will either produce an effective degree of immunity quickly enough and of sufficient duration to warrant its use? Judging from the erratic immunity produced even by large doses of highly virulent cultures, we are unable as yet to see a useful place for swine-plague vaccines and bacterins in practice.

In outbreaks of hog cholera complicated with swine plague, the mortality is measurably higher than is observed in uncomplicated hog cholera. Even transient protection against the effects of *Bacterium suisepticum* produced by a product that would take effect rapidly, and which would be incapable of doing actual harm, would be useful in outbreaks of this kind. Thus we hope that a serum produced from hogs hyperimmunized against both diseases will be of value, but our work with this product has not progressed far, and we do not care to hazard an opinion.

Our best prevention of swine plague at the present time is to keep devitalizing influences or predisposing causes, especially hog cholera, out of the herd.

REMARKS ON "HOG FLU" [1]

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THE OCCURRENCE of diseases which affect the respiratory organs of swine has long been recognized. The visible symptoms which usually result from a pneumonia or pleurisy, or both, are seen frequently in cases of hog cholera, of verminous pneumonia and of swine plague, or what some have seen fit to call hemorrhagic septicemia. It has been commonly admitted, however, that, eliminating those cases which accompany other specific infections, such as hog cholera, the pneumonias of swine occur for the most part as sporadic infections and practically never as herd diseases.

However, in the fall of 1918 there appeared, for the most part in the Middle West, a disease of swine clearly independent of hog cholera and of parasitic infestations, which presented as its chief symptoms labored, jerky respiration, a severe spasmodic cough, fever, and usually great prostration. While this train of symptoms might for the most part be observed in the ordinary pneumonias of swine, the suddenness of the onset, the simultaneous attack on a whole herd, or on a very large proportion of a herd, taken together with the usual prompt recovery within a few days, led many practitioners to conclude that they had to deal with a new disease of swine.

Dr. J. S. Koen, then an inspector in the Division of Hog Cholera Control of the Bureau of Animal Industry, not only recognized this disease as being different from any that he had previous encountered, but was so much impressed by the coincidental prevalence of human influenza and by the resemblance of the symptoms seen in man to those occurring at that time in hogs that he became convinced that the two were actually the same, and he therefore gave the name of "flu" to this new disease of hogs. Subsequent observation has not served to substantiate Dr. Kœn's original assumption that human influenza and "hog flu" are the same. In fact, although the etiology of both diseases remains undetermined, the continued and appar-

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

ently unabated prevalence of "hog flu," taken together with the marked decrease in human influenza during the past two or three years, leaves little ground for the belief that there is a relationship between the two diseases. The name "flu" as applied by Koen seems nevertheless to be rather apt, it has been generally employed, and we are inclined to continue its use pending a better understanding of the etiology of this disease. We realize that objections have been raised to this name apparently because the same term had been applied previously to human influenza, and for that reason the name "hog flu," as employed by Murray, should be used to avoid confusion.

If we recognize the existence of "hog flu" as a distinct disease it becomes necessary to define its characteristics as sharply as possible in the light of available information. While Koen and Murray in particular have already given excellent descriptions of this condition, there has been some tendency to confusion. Jay, for example, seems to employ the name "flu" synonymously with "thumps," and quite recently in reporting the results of an extended study of the bacteria in normal and diseased lungs of swine, Spray[1] refers to "infectious pneumonia" as being synonymous with "hemorrhagic septicemia" and "flu." As already indicated, we are of the opinion that "hog flu" should, pending further investigation, be recognized as an independent disease, and we offer the following description, based upon our own observations, with the hope that it may aid in a small way to clarify this subject.

Hog flu is essentially a disease of the fall, winter and early spring months. Exposure to cold and dampness with inadequate or cold sleeping quarters seems to predispose to the infection. The onset is sudden and all or a large part of the herd will quickly develop the gravest symptoms. We recall a herd of 102 shoats weighing from 100 to 150 pounds in fine condition on December 3. On December 4 the owner first noticed symptoms of sickness. On December 6 eleven had died and the entire remainder of the herd was so sick that they could be walked among and even kicked without forcing them to move. Recovery is about as rapid and as surprising as the attack. Indeed, in the herd just mentioned, although the loss

[1] Rob. Spaulding Spray, "The Bacteria in Normal and Diseased Lungs of Swine." In *Jour. Inf. Dis.*, vol. 31, no. 1, p. 10, July, 1922.

from death was much greater than in any other herd observed by us, the state of severe illness remained practically unchanged until the sixth day, when there was a remarkable change in the condition. Practically the entire herd was up and eating and a large number were out in the yard moving briskly about and apparently recovered. The disease, therefore, seems to terminate by crisis, although the loss in condition of the recovered animals remaining is very marked.

With reference to the symptoms exhibited by individual hogs, our experience has been that they point almost exclusively to the respiratory organs. Some observers have reported diarrhea as a prominent symptom. Such has not been our experience, although we do not, with our present knowledge, question the occurrence of diarrhea in outbreaks of "hog flu." In our cases the sick hogs exhibited a labored, jerky breathing. At times individuals were seen resting on the sternum with the forelegs extended. Particularly when disturbed, there is a hard paroxysmal cough, which may continue until the hog seems to clear the air passages of obstructing mucus. The temperature is frequently high, 108° F. being observed in a few instances, but this is not uniform. In one herd, apparently a rather mild type of the disease, the temperature ranged from 101.5 to 105.5. Great prostration and complete loss of appetite marked the height of the attack. As stated, recovery from these grave symptoms is rapid and complete, though, depending upon the severity of the attack, some time may elapse before the loss in flesh is regained.

Since the mortality from this disease is low, the practitioner will generally have but few opportunities for postmortem examination. In practically every case of death that has come under our observation we have found congested or hemorrhagic cervical and bronchial glands and a lobular pneumonia of varying extent. The trachea and bronchi usually contain a tenacious muco-pus which may be tinged with blood. In some cases killed for autopsy hemorrhages were visible over the surfaces of the lungs and there was a practical absence of consolidated areas. Other organs show as a rule no departure from the normal, although reddening of the intestinal mucosa, patchy congestion of the kidney and in one case petechiæ on the mucous surface of the bladder have been observed. The death rate from this disease is low. The average probably does not ex-

ceed 2 or 3 per cent. In one herd the loss by death was 25 per cent, but this was quite exceptional.

With respect to etiology we are still much in the dark. Exposure to cold and dampness without adequate warm sleeping quarters seem to be predisposing factors. Murray has reported the isolation of a micrococcus with which he was able to produce symptoms of hog flu in pigs by intravenous injection. Quite recently Spray, during a study of the pneumonias of swine, isolated a streptococcus, which, however, is clearly not the same as Murray's and which proved to be nonpathogenic for laboratory animals. Our own work has thus far led to no conclusive results. At the very beginning we found difficulty in reproducing the disease in pigs.

Blood of hogs affected with "flu" is usually without effect when injected subcutaneously. Intratracheal injection of mucus from the trachea and bronchi of pigs affected with flu has usually been without effect, and suspensions of such mucus as well as suspensions of macerated diseased lung tissue poured into the notrils of healthy pigs have usually failed to reproduce the disease. In a few instances, where exposure by pouring suspensions of mucus from the trachea of affected pigs into the nostrils of healthy pigs was followed promptly by spraying the exposed pig with cold water so as to produce a marked chilling, we have succeeded in inducing symptoms that correspond in all respects to those of "hog flu."

Bacteriological studies have given conflicting and irregular results. We have not been able to isolate the micrococcus described by Murray. From one large herd with typical symptoms there was recovered a small bipolar staining organism which is culturally identical with *Bacillus bronchisepticus*, believed by Ferry to be the cause of canine distemper. We were unable, however, to produce any symptoms of "hog flu" with this micro-organism. Leaving out of consideration *Bacillus coli* and other bacteria which were isolated but which appeared to be of no significance, we may record the isolation of *Bacillus suisepticus* from about 50 per cent of the cases examined, and of a nonhemolytic streptococcus, as yet unclassified, from a like proportion of cases. With pure cultures of the last-named organisms we have thus far been unable to reproduce the typical disease. We are planning to continue our researches through the approaching fall and winter, in the hope that with the aid

of cold weather we may gain more light on the etiology of this puzzling infection.

Inability to reproduce hog flu regularly in experimental animals has prevented any study of specific methods of treatment or prevention, and the present state of our knowledge of the etiology is such that any attempt to prevent or cure the disease by means of vaccines or sera can be carried out only in a haphazard way.

The very low mortality which generally results when only good care is used in handling these herds certainly of itself renders questionable the wisdom of undertaking expensive inoculation with bacterins, vaccines or other biologics. The veterinarian, it would seem, must at least advise his clients of the facts and leave to them the final decision. For our own part we believe that good housing, including warm, well-ventilated sleeping quarters free from drafts and from excessive dust, will be found to be the most effective treatment that can be employed.

In concluding this brief paper we wish again to emphasize the sudden attack on large numbers of hogs, all of which present the characteristic jerky breathing and hard cough, as being the principal diagnostic sign by means of which hog flu may be differentiated from other swine diseases.

DISCUSSION

CHAIRMAN REED: This interesting paper is now open for discussion.

DR. STOUDER: I feel that this paper should receive considerable discussion, because through the Central West—particularly in fall and winter, I think, more than in early spring—we see this condition, have it reported an enormous number of times, and I am confident there is a wide variation of opinion as to the cause of this disease. I can supplement what the authors have said by saying I have seen this disease in only part of a herd, and I am impressed with the fact that practically always the part of the herd that is affected is under bad housing conditions. There are two extremes under which the average Iowa farmer usually houses his swine. One is the house that is extremely drafty, floor draft particularly being a noticeable thing. In the early fall our average farmer will run 100 to 150 young shoats. They do not need much shelter, and when fall comes they go in perhaps to the driveway between the common double crib elevator, and here, with the sliding doors, which seldom fit, the floor drafts are strong. This herd will probably suffer "flu." Three or four sows and their litters, that have access to the good hog house, remain free, and nothing but a wire fence separates the herds. I have frequently seen that condition on a farm.

The other extreme I see very often in the spring is that of a farmer with a hog house that is good. Most of our farmers are prosperous enough to build a good hog house, with cement floor, cemented about two feet up, and a drop siding lumber wall just as tight as it is possible to build. The roof is set on tight, and even

the overhanging, where the lookouts go over, the wall is mortised in with quarter round. This house is adequate in its air capacity, with the usual chimney, to house 20 or 25 mature hogs, or perhaps double that number of immature hogs; but 20 sows with 100 to 130 pigs are housed in here. This house is shut up as a rule, except for a half door at night, and a lot of complications will follow as soon as the hogs get off their feed. Across the barnyard are two or three sows living in a horse barn, absolutely free from this disease. Adequate ventilation, as the author suggests and impresses, without floor draft, is the solution, I am confident, of a very, very high percentage of the so-called "hog flu," which I think is a pneumonia brought on by extremes of condition. I suppose sometimes we find the disease aggravated by the dust these animals are living in.

It is significant to me that, as yet, we are not able to reproduce this disease by inoculation, unless we lower the vitality of the hog. The lowering of the vitality of the hog is the easiest thing in the world, if you go at it right. Just do something that disturbs his respiration. On a cold winter day let him have a cold bed, or let him be in a floor draft, or put him in a hog house that is pretty close and warm, or has two or three chimneys or outlets on the peak that encourage floor draft. That isn't the way to ventilate any building; it encourages floor draft. That is, however, what your average farmer has, and what we need is to pay considerably more attention to the proper ventilation of the hog house.

DR. KINSLEY: I have been very much interested in the paper and also in the discussion. There are two or three vital questions on which, it seems to me, if it is possible to give light on, those who have the information should reveal it at this time.

First: The symptoms as described are very like those of hog cholera. Should this disease occur in a herd of swine that are not immune to hog cholera, how can the practitioner differentiate between "hog flu" and "hog cholera"? As stated, the symptoms outlined consisted usually of a high temperature, inactivity, a tendency for the swine to remain in their beds, which is a very good though brief description of hog cholera. In other words, the two conditions are very similar.

As I caught the distinction intimated by Dr. Niles—I do not know that he stated it plainly—there is possibly this difference: So-called "hog flu" is a herd disease that affects a larger percentage of the animals usually at once than hog cholera. Hog cholera may occur and affect a large percentage of the herd at once, but usually it is not nearly so large a percentage as is found in "hog flu."

In reference to Dr. Stouder's suggestion, I rather doubt if swine, say, five or ten years ago, were better housed than they are today. Did "hog flu" actually exist ten years ago? And yet were the housing conditions then any better than today? If those housing conditions produce or are contributory to the disease today, why were they not contributory then? Would that not seem to indicate that this disease is some infection? It seems to me to point to some infection. But I believe the question of distinction between this disease and hog cholera, clinically, is what is needed at the present time for the practitioner.

I would like also to ask what are the consequences should a herd of swine susceptible to hog cholera be affected with "flu" and be treated with hog cholera serum and virus? What would be the consequences if the practitioner should make the mistake in diagnosis?

DR. STOUDER: There has been a marked increase in the better type of building in which we house hogs in our country. We know this because our Section on Agricultural Engineering has made surveys in different counties in the State and found that there has been constantly an increase in the amount of money spent and the amount

of building, and there has been a marked increase in the housing.

I also remember nine or ten years ago being called into one of our southwestern counties, and I, no doubt, ran into a case of "hog flu." I diagnosed it as hog cholera. Conditions there led me to say to the owner: "My advice is to get a veterinarian to immunize your hogs as soon as you can." For some reason, I think lack of opportunity to get serum, they never treated that herd of something over 100 head of hogs, and they never lost but two. To this day, if I meet that man or any of his neighbors, they have a good deal of sport telling me my statistics on hog cholera are away off. I evidently struck something of this character. Hearing the history, seeing the herd, finding evidences of some constipation, and some pigs showing evidences of diarrhea, with a high percentage, nearly half, lying about on the sternum, hardly able to move, and with no opportunity for postmortem, I felt very certain of hog cholera and so advised this owner. But today I am in bad repute in that community as a diagnostician. I evidently made a mistake.

We have, however, had a great increase in the type of tightly constructed hog house that we have built in our country for the last ten years, because there has been a wonderful amount of work done on drawing plans and assisting the farmer in devising types of hog house. The increase in swine as a continuous livestock proposition has brought about very much better hog houses, as some of our county surveys show, in the last five or six years than there were previous to that time.

I have often made the statement—and I have yet to have anyone show me that it is erroneous—that I do not believe a herd of hogs ever suffer from this disease if they live in a low-hung cattle shed that is deeply bedded with straw. I have not happened to see it in that type of building, where there is a long overhang of the roof and plenty of room for the herd to go in and lie in. But they are affected by this disease where we put them in the average hog house, a tight building with air doors on the roof, or no ventilation, a roof that will get frosty in the winter and drip water. We see it very frequently then, particularly if we have heavy, foggy weather, if we have high winds, or if we have a reasonably warm day, as we do in October, with temperature running up quite high and then pretty cool nights.

I remember about four years ago this disease was reported to us by long-distance telephone from pretty nearly all parts of Central Iowa. In November, the first or second week, we had high winds for about thirty-six hours, and this disease was everywhere immediately after.

I remember seeing it last winter in a herd of hogs that were housed in a shed that was as loose as could be; but in a herd of hogs living in a shed of much the same type, down in the valley, there was not the least bit of trouble. I feel sure it was superinduced by exposure. Perhaps infection does give us the lesion that is found in the lung, and gives symptoms especially of temperature and depression, and things of that kind; but it must be assisted, I believe, by physical exposure.

DR. CAHILL: I think Dr. Niles's report on "hog flu" brings two or three very, very pertinent points point-blank before this Association. It seems to me that the most important of all is an official or a semiofficial admission that swine suffer with diseases other than hog cholera. If his paper did nothing other than to convince the practicing veterinarian that every case of disease he sees in swine is not hog cholera, then this meeting has made one big, long stride, and I hope that it goes to the utmost corner of every State in America. It is a pretty serious state of affairs when we come to the conclusion that an animal can be affected with only one disease.

It is because of that opinion, held by some of us during the past few years when sickness in swine has been so much more prevalent, that veterinary practice is being discredited, and that a great deal of discredit has been thrown on simultaneous treatment of hog cholera.

I believe Dr. Niles did not mention, although he has previously told me, and Dr. Dorset has previously told me, that this condition is practically as prevalent in immune hogs as in susceptible hogs. I am not sure that is in the paper, but I have been advised of that by both gentlemen. If that is so, we have another important factor before us. Is it not possible, I would ask Dr. Niles, that some of the cases of vaccination trouble, particularly in the heavy hogs that are supposed to be immune to hog cholera and are later diagnosed as hog cholera, are really "flu," and the simultaneous treatment is being discredited in this manner?

There is one thing that is not clear to me, and I say this after being favored with a long talk with Dr. Dorset on the subject recently. I would like to know how we are going to differentiate, clinically, between so-called "flu" and so-called "protein poisoning" as given by another Bureau of Animal Industry employee. The symptoms given as "hog flu" are identical with the symptoms given by Jay as "protein poison." The onset is extremely sudden, inappetence is mild, mortality is low, and animals recover with practically no treatment if moved to sanitary quarters and diet changed. If the animals are not given any food for a few days, recovery is complete. I would like to differentiate between the two.

Any of us who are privileged to examine large numbers of specimens from field cases of sickness in swine are undoubtedly united in one thing, and that is that you can take any set of symptoms and you will not have uniform postmortem findings, you will not have uniform bacteriological findings for more than two months. By this I mean that you may examine specimens from any section of America and you may find *B. suisenticus* for a period of one or two months, and, without any warning, there is a complete change; you will get nothing but a streptococcus.

While Spray was working with his specimens he came in contact with one of the intermediate organisms almost constantly, and he was unable to get another culture from the same identical specimen. He came constantly in contact with a streptococcus. Other laboratories in Indiana had the same experience, and when a few of us were privileged to meet and discuss this, we found that for a period of one to two months we all obtained from our specimens an organism of the streptococcus. Then at approximately the same time, from cases showing the same pathological changes, we all obtained *B. suisepticus*.

It seems to me, in view of those circumstances, that before we become very enthusiastic regarding "flu" we must realize that without the symptom changing, the etiological factor of diseases of swine apparently does change.

DR. QUINN: Dr. Cahill, I believe, has expressed the opinion of a good many practitioners who are meeting this condition in the field, not in winter alone but throughout the year, under most discouraging housing conditions and under most ideal housing conditions. In hogs, regardless of simultaneous immunity or other treatment, the consensus of opinion is narrowing down to the fact that diet is a very essential factor in the occurrence of this disease. Some of the arguments that have been put up in favor of a dietary cause of this trouble are: First, that the disease is extremely rare as a specific condition in suckling pigs on a balanced ration of milk. Second, it is most common in pigs that are forced fed or in over thrifty conditions, on exhibition at State fairs, swine shows, etc. The condi-

tion as Dr. Stouder has stated is very uncommon in pigs that must forage some distance for a living, that are kept in the open and are as a rule not in an overly fat state. The third reason for a dietary cause of this trouble is that the period of incubation, as a rule, is not manifest. In herd after herd that is normal and well today, tomorrow 90 per cent show a very aggravated trouble. There is not the initial loss of pigs or the initial manifestation of trouble that you get with hog cholera or any of the so-called bacteriological diseases of swine.

The treatment itself is also conclusive in some ways of the diet relation to this trouble, because if these pigs are immediately taken and subjected to a good, thorough purgation, recovery is much more prompt. The mortality in this condition is not parallel with any bacteriological trouble that we are at present acquainted with. Taken all together, the absence of a period of incubation, the usual presence of forced feeding, or exhibition under conditions that will constipate, are predisposing factors, at least, to this trouble.

The disease, to most veterinarians, does not seem hard to differentiate from hog cholera, because of the fact that the trouble is confined to the respiratory tract and the symptoms are those of acute edema of the lungs. The cough is deep seated and moist, and the excretion from the eyes is not usually present in the pigs. The temperature is variable and constipation in almost all instances is marked. The postmortem findings are usually a very extensive edema of the lungs.

DR. KELSER: I would like to ask Dr. Niles if any special efforts have been made to isolate organisms of an anaerobic nature. I raise that point in view of the recent findings of the Rockefeller Institute in connection with "flu" in man. They have recently isolated an organism which they hope to prove the cause of "flu" in man. That organism is one which will pass, in certain stages, the various bacteria-retaining filters. It is found only in the early stages of the disease. Irrespective of whether they find this organism to be the true cause of "flu" in man, it points out the necessity of going into the bacteriology from an anaerobic standpoint in the study of some of these "flu" diseases of animals. In view of the analogy between influenza of man and horses and so-called "swine flu," it appears to me that we have been giving too little attention to the possibility of anaerobic infection. The possibility exists that something of that nature might be found in some of these "flu" diseases of animals that have been giving us considerable trouble.

CHAIRMAN REED: I will call on Dr. Niles to sum up the discussion and to answer the various questions as he sees fit.

DR. NILES: This "hog flu" is certainly a most vital question, and the authors of this paper do not claim to know any more about it than anybody else.

In answer to Dr. Kinsley's question, the sudden onslaught of the disease, a large number of the herd being attacked, and the jerky respiration, serve to differentiate between that and hog cholera. When you first go to a man's place and see the herd, it does look very much like hog cholera that has been allowed to run until every animal has become sick. I do not doubt that there are cases where you might not be able to differentiate simply by medical symptoms. As Dr. Cahill said, immune herds are attacked the same as nonimmune herds.

Dr. Stouder gave a most excellent description of the symptoms of this "flu" as we see it in Iowa. The fact was not brought out in the paper that the disease is on the increase in the Middle West, particularly in Iowa. We saw and heard much more about "hog flu" last fall than we ever heard before in Iowa. In many counties practictioners have reported that 90 per cent of the herds had been attacked with "hog flu." I am not sure but what possibly the disease is be-

coming a little more settled. I believe the mortality is a little less than it was before. We saw one herd in which 25 per cent of the animals died. The blood from this herd was injected. The symptoms and lesions did not indicate hog cholera in this herd.

Answering Dr. Kelser, we did some work in attempting to isolate the anaerobic organisms, but I do not think the work was extensive along that line. I know some work was done, but we have not so far been able to secure material enough to make extensive studies of this disease. When you hear of this disease some distance from home, by the time you get there perhaps the hogs are largely recovered. and not being able to reproduce the disease, we have not been able to continue the study.

It is a puzzling question as to why we did not hear more of this disease prior to the last few years. I have no doubt that it did occur, but we did not have much of it before we had the appearance of "flu" in people. I do not think they have any connection, but that was about the time of its appearance, and it is becoming more prevalent, and I think we will hear of a lot more of it in September, October and November.

While it is true that something very similar appeared in hogs exhibited at the fair. I do not know whether it will develop at the State Fair of Iowa or not. I do not know whether that is the same thing, but it resembles it.

One gentleman referred to the housing, ventilation, etc. I do not think that cold is anything more than a predisposing factor. Cold weather seems to act as a predisposing factor. I do not know why this infection is more widespread now, but it does look as if the hog was harboring some organism which is stirred into activity by change in atmosphere.

One of the herds that showed the most signs was a herd that ran in the cornfield and slept at night in the field. It was the habit of the hogs to stay out there both night and day. It is the practice of hogs that are being turned into cornfields to stay out in the field, sleep in the field and not come into the hog house until the weather gets severe. The herd showing the most characteristic symptoms was a herd housed in this way. In November, one rainy day, these hogs slept out, and two days later they developed symptoms of "hog flu," and about 10 per cent of them died.

There are a lot of questions that may be asked that we do not know anything about. We hope that we may make some discovery along these lines; we hope to find out something about the etiological factors. In the meantime we present these observations for what they are worth.

A directory of Belgian veterinarians published by the *Annales de Médecine Vétérinaire* shows 695 civilian and 99 military veterinarians. Eleven of the latter are on the retired list and 4 are on special service in the Congo.

An English butcher has found a number of old coins in the stomachs of bullocks slaughtered after grazing on certain marsh lands, the dates on the coins ranging from 1674 to 1806, so says our veracious contemporary *The Veterinary Record*. This may give a clue to the location of Captain Kidd's buried treasure.

THE ROLE OF THE UDDER AND ITS SECRETION IN BOVINE INFECTIOUS ABORTION [1]

By WARD GILTNER, I. F. HUDDLESON *and* R. L. TWEED
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INFECTIOUS ABORTION of cattle is not only a disease of great economic importance but it is a stupendous problem or an aggregate of subproblems of much scientific interest. We are not by any means in total darkness as respects the problem, but there are many of the subproblems that are much in the shadows of ignorance or misinformation. It has been known for some time that *Bacterium abortus* finds the udder of the cow a suitable habitat and that the organism persists in the udder in some cases more or less permanently. These are very significant facts from a practical standpoint, and it is the purpose of this paper to discuss the various aspects of these facts and their probable or known significance.

Obviously the things that are of importance or the questions that need answering in this connection include the following: How does the germ get into the udder? Why does it establish itself there in some cases and not in others? When does it appear in the udder? How long does it persist under various conditions? What changes, structural or functional, local or general, is it responsible for? How numerous are the abortion bacteria in the milk? Are they virulent or nonvirulent, and why? Do they invade the system, including the uterus, pregnant or nonpregnant? What part does milk play in the spread of infectious abortion to cattle? To swine? To any other species of animals? Is raw infected milk in any sense dangerous to man, and if so, under what conditions? If milk from infected cattle is important in the spread of the disease, what steps may be taken to eliminate or minimize the danger? These and other questions of similar or lesser importance have been answered more or less satisfactorily or need answering urgently. It appears to us that the solution of the bovine infectious abortion problem is dependent on a knowledge of the part played by the udder and its secretion in the event that this factor is either of great importance or of no importance. Its importance must be

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established, else our efforts to control the disease will reflect the confusion in our minds on this one probable source of trouble.

EXPERIMENTAL STUDIES

That *Bacterium abortus* is excreted with the milk has been shown by Schroeder and Cotton (1),[1] Fabyan (2), Zwick and Krage (3), Cooledge (4), Evans (5) and others. Cooledege (4), Evans (5) and Huddleson (6) have studied the cultivation of *Bacterium abortus* from milk. The last named seems to have come nearest to a successful and practicable method and incidentally to have thrown light on both the fundamental physiological requirements of the organism and the fact that these requirements are peculiarly met in the udder.

Huddleson (7) has had a high degree of success in cultivating *Bacterium abortus* in an atmosphere of 10 per cent carbon dioxid, which is probably the CO_2 tension inside the udder, since freshly drawn milk from the healthy udder shows approximately this pressure of CO_2. He has also determined the optimum pH for the growing of the organism, namely, 6.6. With the improved methods of cultivating the organism from milk it appears certain that it occurs in very limited numbers even in the most pronounced cases. In making a bacteriological study of several carriers he found that the number of organisms in a given sample would vary from one to about 200 colonies. This represents the number of *Bacterium abortus* in one-half of the sediment of a 10 c.c. sample. This, of course, is not an accurate measure of the total number present, but nevertheless it gives us sufficient information for speculation.

Fleishner, Vecki, Shaw and Meyer (8) infected goats with *Bacterium abortus* and report the subsequent finding in the milk of 100,000 to 250,000 viable organisms per cubic centimeter. The finding of this number of *Bacterium abortus* in the milk of goats, however, is not a criterion of the number present in cow's milk.

How the germ gets into the udder under natural conditions is a matter of conjecture. Except for the report of Schroeder and Cotton, no one has yet been able, experimentally, to introduce the organism through the teat duct and thereby establish a carrier state in the udder and produce changes similar to or

[1] Figures in parentheses following authors' names refer to bibliography at end of paper.

identical with those found in natural infection in so far as we are able to determine. Since it has been determined that the germ may and probably does travel in the blood stream, it is only reasonable to conclude that it is taken out by the udder, conditions being anatomically possible and physiologically favorable. How to keep the bacteria out of the udder is, of course, the whole question, and resolves itself into the prevention of general infection in the cow and possibly the prevention of entrance into the teat duct by the obvious practices of sanitation. Why the udder is not always affected or affected to the same extent is only a matter of speculation.

Whether the udder infection is the primary or one of the secondary manifestations of the infection in the animal is not known, but probably cases of both types occur. The matter is of practical importance, since upon it hinge such questions as whether the udder infection is or may be frequently only a minor local affection or whether it constitutes a standing menace to the pregnant cow as a storehouse from which the germs may invade the body at any unfortunate time. Next in importance to the prevention of a general infection in an animal is how to destroy the organism in the udder once it is established. The solution of this question will probably mean the control of the spread of infectious abortion. In the line of direct experimental evidence, Schroeder and Cotton (9) have found *Bacterium abortus* in the lymphatics draining the udder, thus indicating that its presence in the udder is a menace to the body, more specifically to the pregnant uterus. On the other hand, the germ seems to persist in the udder indefinitely in some cases which regularly avoid any troubles of conception or parturition. The persistence of *Bacterium abortus* in the tissues of the udder is probably due to the establishment of an equilibrium between the organism and the ability of the body cells to produce sufficient bactericidal substances for its complete destruction. What factors influence the entrance of the germ into the udder other than referred to, its persistence there or its complete or partial elimination from that organ are undetermined.

The changes produced in the udder seem to have been sought by Schroeder and Cotton (10) at autopsies with negative results. Cooledge (4) showed that milk from infected udders contains agglutinating and complement-fixing antibodies for *Bacterium abortus*. In a few cases it appeared that these antibodies

occurred in the absence of infection, so that the question arose as to whether they may not have been produced systemically and excreted with the milk. In other cases it seemed quite clear that they were produced locally. Cooledge (11) also undertook to determine the significance of the cell count in infected udders. He concluded that a high cell count together with a high antibody content indicated an infection, since such milk as a rule suffices to produce the disease in guinea-pigs upon intraperitoneal injection of 5 c.c. quantities. He did not undertake to determine the source of the cells.

Later work by Tweed (12) indicates that cows' udders which carry an active infection have abnormally high cellular counts and that the cells found in the milk from these actively infected udders are mostly leucocytes and not epithelial cells as contended by Hewlett, Villar and Revis (13). These leucocytes probably come from the blood stream, as a very close relationship has been found to exist between decreasing hydrogen-ion concentration of the fresh milk and an abnormal number of leucocytes. Baker and Breed (14) attribute this decreased hydrogen-ion concentration to the entrance of the alkaline substances of the blood into the milk, together with other substances found in the blood stream. During the past year O. H. Friedeman (15), working under the direction of Tweed, undertook to determine the pathological changes that take place in an infected udder. He worked under very carefully controlled conditions with only one positive udder and one negative control, and his results were negative in so far as histo-pathological changes were concerned; or, to put it in another way, he found nothing in sections of the one that he did not find in sections of the other udder. His sections show leucocytes in the lumina of the alveoli, thus indicating their hematogenous origin. Otherwise his results confirmed those of Cooledge (11). While his work was not sufficiently extensive to warrant general conclusions, it is not such as to convince one that *Bacterium abortus* udder infection is attended by detectable gross or microscopic alterations such as catarrh or abscess formation. The hope of finding such alterations rests on the basis of the relatively small number of cells (assuming them to be pus cells) in the milk reported by various workers.

Another fact that throws doubt on the possibility of finding lesions in so-called infected udders is the very small number of *Bacterium abortus* found in milk. Recently we have succeeded in

isolating *Bacterium abortus* directly from whole milk. The number isolated averaged 80 per cubic centimeter of milk.

In this connection it is interesting to note the work of Evans (16), Meyer and Shaw (17) and Kahled (19), an effort to show the relationship between *Bacterium abortus* and *Micrococcus* (*Bacterium*) *melitensis*. The two organisms are undoubtedly closely related, but there remains a distinct difference between their invasive properties. This fact is clearly demonstrated by the differences in the length of time required to produce an infection in experimental animals with either of the two organisms. According to Fleishner, Vecki, Shaw and Meyer (8), the ingestion by monkeys of virulent *Bacterium abortus* supplied in the naturally infected milk of a goat may lead to a generalized invasion of the tissues and even the heart blood, while the ingestion of abortion bacilli of a low virulence in small numbers does not lead to an infection even when fed for 30 days.

From previous investigations it appears that the inability to produce an infection in animals by feeding milk naturally infected with *Bacterium abortus* is due to the small numbers of organisms present. Our studies as well as those of Evans (5) indicate this to be a fact. In fact, according to the report of Shaw (19), cows infected with *Bacterium melitensis* eliminate very few organisms in the milk. That naturally infected milk will not lead to an invasion of the tissues of calves or swine has been clearly demonstrated in the experiments of Huddleson (20, 21), Hayes (22) and Simms and Miller (23), and in humans by the experiments of Colledge (24). The latter also added pure cultures to milk and fed it to human subjects with practically negative results. The cultures of Cooledge may have been of low virulence, however. Huddleson (25) and Meyer, Shaw and Fleishner (26) have recently demonstrated the difference in pathogenicity of strains of *Bacterium abortus* for guinea-pigs. A knowledge of the pathogenicity of strains is certainly essential in experimental studies.

The virulence of the organism found in milk is demonstrated by the work of all the early workers who used guinea-pigs as the test reagent for determining the presence of the germ in milk. But again virulence for guinea-pigs may not be equivalent to virulence for cattle, man or swine.

In summing up all of the data which have accumulated on the subject, we can say only that there is no positive evidence

to warrant the assertion that milk from an udder carrying *Bacterium abortus* is an important factor in the spread or transmission of bovine infectious abortion. This statement does not apply to the infected udder as respects its ability to release organisms to the circulation, either blood or lymph. That carrier cases (those that carry the germs in the udder but do not abort) repeatedly show the organism in the uterine exudate at parturition has been observed by Schroeder and by us. Such cases are no doubt the prime source from which many infections originate. This condition is not apparent to the breeder, and such cases are given little or no attention before or after parturition. To us the carrier state appears to be one of the most important problems in the study and control of infectious abortion. The application of biological preparations or chemicals to alleviate such a condition has apparently been given little attention. We are studying the use of vaccines with this phase of the subject in view, but the success thus far obtained can not be considered encouraging.

The elimination of infectious abortion can not be expected until a successful method has been obtained for the prevention and cure of the carrier state. Before this can be accomplished a thorough study must be made of the factors involved in the passage of *Bacterium abortus* from the circulatory systems to the udder and in the opposite direction, and the factors which lead to the persistence of *Bacterium abortus* in certain tissues, such as the udder.

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THE CHARACTER AND POSSIBLE SIGNIFICANCE OF THE BANG ABORTION BACILLUS THAT ATTACKS SWINE [1]

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IT IS MY BELIEF that until a few years ago most investigators who had studied the abortion bacillus of Bang were of the opinion that it was not a factor of importance except for cattle. Early investigations indicated that swine were rarely if ever infected with it. McFadyean and Stockman in their Report on Infectious Abortion in Great Britain, 1909, expressed the opinion that bovine abortion is essentially a disease of cattle, and, although other species can be experimentally infected, they are not likely to contract the disease in practice excepting as the result of gross carelessness in the disposal of infected material. I believe that for many years most investigators shared this opinion.

In our earlier work Dr. Schroeder and I tried to produce abortions in pregnant sows by the injection of *Bacillus abortus* in both cultures and tissues, but failed in every case to do so. We were able to infect boars by the intravenous injection of large quantities of suspensions of cultures of *B. abortus*, but the infections were only transient. In these cases we injected a number of boars, and killed one each week, up to and including the fourth week following injection, and also at the end of the eighth, fourteenth, eighteenth and twenty-second weeks, and tested their organs for *B. abortus* by guinea-pig inoculations. We were able to recover the abortion bacilli from the boars up to and including the eighth week but not beyond. The organs tested for these bacilli were liver, gastrohepatic glands, epididymides, seminal vesicles, inguinal glands and Cowper's glands. Abortion bacilli were at different times recovered from all of these. These results led us to conclude that the tissues of boars were not ordinarily favorable habitats for the abortion bacillus. We were, however, working with strains of the organism isolated from cattle.

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Connaway and his associates (Infectious Abortion in Swine, 1921) pointed out that Traum isolated *B. abortus* from the aborted fetus of a sow while working in the Pathological Laboratory of the Bureau of Animal Industry in 1914. Two years later Good and Smith, of the Kentucky Experiment Station, reported that they had isolated the organisms from aborted swine fetuses. The year following Connaway, Durant and Newman published the findings of their serological studies on aborting swine. Since then all of the above investigators and others, including Hays and Davis in California, Graham in Illinois, and Doyle and Spray in Indiana, have contributed to our knowledge of abortion disease in swine.

Early in 1919 Dr. Clark Hays, who at that time was in charge of the hog cholera eradication work of the U. S. Bureau of Animal Industry in Indiana, reported an outbreak of abortion among sows in that State, and sent discharges from one sow to the Pathological Division of the Bureau for examination. From these discharges Dr. J. M. Buck isolated an organism apparently identical in nearly all respects with *B. abortus.* Dr. Hays reported that the aborting sows were bred very soon after they aborted, and that some aborted a second time.

Dr. Schroeder and I obtained from Dr. Buck a culture of the organism noted above. This culture grew more luxuriantly than the strains of abortion bacilli, isolated from cattle, which we had studied, but serologically and microscopically was identical with them, being agglutinated in the same dilutions by both cattle and hog sera, as were the strains isolated from cattle. When tested by guinea-pig inoculations, however, we found that there was a distinct difference in the lesions produced. The former was the more virulent for guinea-pigs, and produced in them certain lesions which we had not before observed in guinea-pigs inoculated with *B. abortus.* We thought at first that some contamination in the culture, either acting alone or in symbiosis with *B. abortus,* was responsible for the unusual lesions, but repeated inoculations of cultures and guinea-pigs convinced us that this was not the case.

The strains of *B. abortus* isolated from cattle, which we have studied, seldom produce necrotic lesions at the site of inoculation or in the adjacent lymph glands, when the inoculation is made in the inguinal region; but the Indiana abortion germ when similarly inoculated causes enlargement and usually necro-

sis of these glands, the glands often being converted into sacs filled with semifluid neorotic material. Other lymph glands, notably those of throat and lumbar regions, are very often affected in the same manner. Enlarged lymph glands are not at all uncommon as a result of infection with *B. abortus* isolated from cattle, and small necrotic foci are occasionally found in them, especially in throat and sub-lumbar regions, but the glands are not converted into large sacs filled with semifluid necrotic material as in the guinea-pigs infected with the Indiana swine germ. The lesions of the epididymides are much more marked and occur in a larger proportion of the guinea-pigs inoculated with the Indiana abortion germ than with those isolated from cattle. These organs are converted into enormous sacs filled with semifluid necrotic material. Guinea-pigs having diseased epididymides, resulting from infection with *B. abortus* isolated from cattle, usually show the contents of the seminal vesicles to be opaque white, but we observed no lesions in the vesicles. The Indiana swine strain, however, sometimes causes abscesses to form in the bases of these organs.

The most characteristic lesions produced in guinea-pigs by the abortion bacillus isolated from swine, however, are those found in the spleen and liver. In the former organ the lesions produced by the abortion bacillus isolated from cattle consist of a uniform enlargement or an enlargement with elevations of the same color as the balance of the organ. Gray areas of solid necrotic material are sometimes found within the organ and often the capsule is thickened. The lesions caused by the abortion bacillus isolated from swine are at times like those described above, but usually are distinctly different. The organ is enlarged and contains spherical nodules varying in size from 1 to 7 mm. in diameter. On section these nodules are found to be filled with semifluid, odorless, necrotic material, identical in appearance with that found in the epididymides.

Many strains of *B. abortus* isolated from cattle do not commonly cause lesions in the liver. When lesions are produced they closely resemble those of tuberculosis—small, irregular, yellowish gray areas gradually merging into the surrounding normal tissue. Lesions of the liver are quite common in guinea-pigs infected with *B. abortus* isolated from swine, but they usually consist of the spherical nodules before described as occurring in the spleen.

In our preliminary study of the strain of *B. abortus* isolated from swine and those isolated from cattle, we observed no other differences than those already mentioned. A year later, in 1920, we received from Dr. Robert Graham of the University of Illinois a culture of *B. abortus* which he had isolated from an aborting sow. We found this organism to behave culturally and serologically the same as that isolated from the Indiana sow. Guinea-pigs inoculated with it showed the same character of lesions, but the lesions were more marked, the organisms seeming to be more virulent than the one from Indiana for these animals. Unusual lesions made their appearance, or, to be more exact, lesions appeared in an unusual place, in some of the guinea-pigs that had been inoculated with subcultures of the *B. abortus* received from Dr. Graham and which for convenience we will call the Illinois swine *B. abortus*. The lesions consisted of spherical nodules filled with semifluid necrotic material identical in appearance with those already described as occurring in the liver and spleen. These were usually found in the depths of but occasionally directly beneath the orbits, and in one case were found at the base of the ear. Sometimes both eyes were found to be affected, at other times one. These nodules often become so large that they cause the eyeball to protrude very much and destroy the sight. Pure cultures of *B. abortus* were obtained from these orbital nodules, and guinea-pigs inoculated with the necrotic material from the nodules showed the usual lesions produced by *B. abortus* isolated from swine. The proportion of guinea-pigs showing these eye lesions in one series of 41 of these animals, inoculated with fetal and placental tissues from swine and a cow which were infected with the Illinois swine *B. aboruts* by means of cultures, was 40.6 per cent, and in another series of 105 inoculated directly with cultures of the same organism the percentage was 29. This indicates that growth on artificial culture media reduces the organism's virulence for guinea-pigs, but that it is restored by passage through swine or cattle. Eye lesions do not usually make their appearance before 8 or 10 weeks after inoculation. Cultures obtained from orbital nodules, or the spleens of guinea-pigs showing such nodules, do not cause eye lesions more commonly than cultures obtained from guinea-pigs with unaffected eyes.

In the thousands of guinea-pigs which we have inoculated with many different strains of *B. abortus* from cattle within the

past dozen years, we have not observed the eye lesions described above. Smith and Fabyan[1] describe eye lesions which they found in guinea-pigs which they had inoculated with *B. abortus* in their earlier work with this bacillus, but so far as we are able to judge from their description they were unlike those which we have found.

Further work with the Indiana strain of swine *B. abortus* showed that this organism at times produced the same kind of eye lesions in guinea-pigs as did the Illinois strain, but not nearly so often.

We obtained a culture of *B. abortus* from Dr. Traum of the University of California, which he had isolated from an aborting sow in that State. We found that this culture also produced eye lesions, and in other respects seemed to be the same as the Illinois strain, but was somewhat less virulent for guinea-pigs.

We are now studying three strains of *B. abortus* obtained from Dr. Connaway of the University of Missouri and isolated from outbreaks among swine in that State. All three produce the same spleen and liver lesions as the Indiana, Illinois and California strains, and one of them also produces the eye lesions. Sufficient inoculations have not been made from the other two strains to determine whether or not they will do this.

In the production of bone lesions in guinea-pigs the strains of *B. abortus* isolated from swine seem to be much more potent than those isolated from cattle. In one series of 105 guinea-pigs inoculated with cultures of the Illinois swine strain, 29.7 per cent developed bone lesions, and in another series of 23 guinea-pigs inoculated with placenta and fetal tissue of sows infected by feeding cultures of the Illinois strain of *B. abortus* over 45 per cent developed bone lesions. Here again we have evidence that the *B. abortus* causing abortion in swine is more pathogenic for guinea-pigs when growing in the placental and fetal tissues of swine than when growing on artificial culture media. Of 124 guinea-pigs inoculated with placental or fetal tissue of aborting cows, 11, or 8.9 per cent, developed bone lesions.

We have never observed bone lesions so gross in guinea-pigs inoculated with *B. abortus* isolated from cattle as were a num-

[1] Centralblatt fur Bakteriologie, Abt. 1, vol. 61, no. 7, 1912, and Jour. Med. Research, vol. 26, no. 3, 1913.

ber of those produced by the Illinois hog abortion strain. This organism not infrequently caused one or more ribs to be enlarged for their entire length, sometimes to four times their normal volumes. On sectioning one of these ribs it was found to consists of a very thin shell of bone enveloping a mass of semifluid necrotic material, the cancellated portion having entirely disappeared. Paralysis due to diseased vertebræ is not uncommon, and it is invariably the lumbar vertebræ that are affected. The lesions in these seem to begin as erosions at the inferior portions of the articulating surfaces and to continue till a large cavity between the two vertebræ is formed. This is usually filled with the semifluid necrotic material already described.[1]

Of the six strains of *B. abortus* isolated from outbreaks of swine abortion in the four States, thus far stulied at the Experiment Station, all produce certain lesions in guinea-pigs unlike those produced by the ordinary strains of *B. abortus* isolated from cattle. All of the swine strains seem to be closely related and differ only in the volume of lesions produced, but not in kind. The Illinois strain seems to be the most virulent for guinea-pigs, the Indiana the least so, and the California intermediate between the two. We have not as yet determined the relative virulence of the three Missouri strains. It is quite likely that the difference in virulence may be due to length of time the organisms have grown on artificial media. The Indiana strain has been isolated between one and two years longer than the Illinois strain.

The important point about these observations which I wish to impress is that we have studied a number of strains of the Bang bacillus isolated from outbreaks of abortion among swine, and that all the strains are somewhat unlike those isolated from cattle in factors in which they closely resemble one another.

Effects of the Several Strains on Sows

In order to determine if cultures of *B. abortus* isolated from swine would cause abortion in sows, several feeding experiments were undertaken. The first one concerned two pregnant sows each of which was given suspensions of cultures of the Indiana

[1] Fabyan describes bone lesions in guinea-pigs inoculated with one strain of *B. abortus* which he isolated from a cow which approaches closely some of the bone lesions here described.

swine strain in four feedings several days apart. One of the sows, No. 3153, gave birth to a litter of 10 pigs 50 days after the first feeding and 25 days after the last, all of which lived. The other sow, No. 3154, gave birth to 14 pigs 89 days after the first feeding and 64 days after the last; three of which were stillborn and two died the day after birth. Guinea-pig inoculations from the organs of the three stillborn pigs were negative. No other inoculations were made, as the afterbirths from both sows were lost.

A month after parturition the serum of sow No. 3153 gave a positive reaction to the agglutination test in dilution of 1 to 100, and that of sow No. 3154 in 1 to 50. Four months later their blood reacted in the same dilutions. A year later both reacted in dilutions of 1 to 100. A boar was placed with them soon after, and fifty days later the agglutination titer of the serum of No. 3153 had risen to 1 to 200, while that of 3154 had fallen to 1 to 50. No further blood tests were made until the boar had been with the sows for about six months, when the blood of 3153 reacted in a dilution of 1 to 800 and that of 3154 showed a slight reaction only in a dilution of 1 to 50. The sows were killed immediately after the test was made, and autopsy of sow No. 3153 showed her to have been suffering from a severe metritis. The walls of the uterus were greatly thickened and impregnated with purulent material. The uterine cavity and Fallopian tubes contained a purulent exudate. The kidney fat showed the presence of kidney worms and several necrotic areas containing material similar to that found in the epididymides of guinea-pigs affected with abortion disease. Guinea-pig inoculations were made from the uterine exudate, portions of the uterine walls, necrotic areas found in the kidney fat and udder tissue. All of these tissues were proved by these inoculations to contain living abortion bacilli.

The uterus of sow No. 3154 contained several fetuses about half term, apparently normal. Guinea-pig inoculations made from these were negative.

Evidently sow No. 3153 had aborted as a result of *B. abortus* fed more than a year earlier. The organisms seem to have become active at least four months before she was killed, as the agglutination titer of her blood had begun to increase at that time. The metritis may be attributed to retained afterbirth. The kidney fat may have become infected through the Fallopian

tubes. The *B. abortus* isolated from sow No. 3153 was identical with that fed a year earlier.

A second feeding experiment was made with the same strain 18 months after the first. In this, three pregnant sows were fed cultures of this strain of *B. abortus* on six consecutive days. These sows all produced apparently normal litters, 66, 79 and 89 days respectively after the feeding, and their blood remained negative to the agglutination test. It is not surprising that this culture was of low virulence for sows, since it had been in guinea-pigs and on artificial culture media for over three years.

Illinois Strain

Six sows were given three feedings of culture of the Illinois swine strain of *B. abortus* within five days. One of these, No. 3347, aborted 35 days after the first feeding. *B. abortus* was recovered from the fetal organs and membranes by guinea-pig inoculations. The lesions produced in the guinea-pigs were very great, and many of the animals developed orbital nodules. The agglutination titer of the sow's blood, when she aborted, was 1 to 50; it had risen to 1 to 200 a montth and a half later, but had dropped to 1 to 50 four months after that. Four of the sows gave birth to apparently normal pigs as follows: Two 62 days, one 52 days and one 92 days after the first feeding. The remaining sow proved to be not pregnant. The blood of one of the four sows reacted to the agglutination test in a dilution of 1 to 100 at the time of parturition and that of another in dilution of 1 to 50. The two remaining sows were negative to the test. The two sows that reacted were negative a month later.

Three additional pregnant sows were each given six feedings of culture of the Illinois strain of *B. abortus* on as many consecutive days. The culture was one recovered from aborting sow No. 3347 before noted, and had been grown for but two transfers on artificial media since its isolation from guinea-pigs inoculated with fetal organs of the aborting sow. One of these sows aborted 35 days after the first feeding. *B. abortus* was recovered from both fetal organs and membranes, and her blood showed an agglutination titer of 1 to 50 at this time. A week later it was the same, but two months after the abortion it had risen to 1 to 400, at which point it remained a month later. A second sow aborted 37 days after the first feeding, but the fetuses and membranes were lost. Guinea-pigs inoculated with material swabbed from her vagina were negative and her blood

remained negative to the agglutination test. The remaining sow gave birth to five apparently fully developed pigs, which were dead when found, but gave evidence of having been born alive, 89 days after the first feeding. Guinea-pig inoculations of the organs of the dead pigs were negative. The blood of the sow showed an agglutination titer of 1 to 200 at this time, and her milk one of 1 to 400. The titer of the blood was still at this height a month and a half later. The sow was crippled about the time of parturition, and was not again able to walk. She was killed one and a half months later, and it was found that she had been suffering from a severe metritis. It was proved by guinea-pig inoculations that both her uterus and udder tissue harbored the abortion bacillus.

The results of the feeding of the same strain of swine *B. abortus* to the two series of pregnant sows above mentioned indicates that the virulence of this organism can be increased or diminished by the character of its habitat. The culture used in the first series of feedings, in which only one of five pregnant sows really became infected, had been under artificial cultivation for much more than a year, while that used in the latter series, in which two of the three sows used became infected, was the same organism recently passed through a sow.

One pregnant sow was given three feedings of cultures of the California strain of swine abortion within five days. She gave birth to six living pigs 14 days after the first feeding and 10 days after the last. *B. abortus* was recovered from the fetal membranes by guinea-pig inoculations. The guinea-pigs showed marked lesions of the kind produced by *B. abortus* isolated from swine. The agglutination titer of her blood at this time was 1 to 50. Two and one-half months later it had almost faded out.

Cattle Abortion Germ

We have tried over and over again to infect pregnant sows through feeding them the ordinary strains of abortion bacilli isolated from cattle, using them in cultures, in guinea-pig tissues and in fetal and placental tissue of aborting cows, but have always failed.

Pathogenicity for Cattle

We injected two pregnant cows intravenously, one 3½ and the other 6 months before parturition, with cultures of the In-

diana swine strain. They produced normal calves, and we were not able to show by guinea-pig inoculations of placental tissue that their uteri had become infected. One of the cows failed to develop an agglutination reaction, while the blood of the other had an agglutination titer of 1 to 50 at the time of parturition, but this had entirely disappeared ten months later.

One pregnant cow received an intravenous injection of suspension of culture of the Illinois strain of swine abortion 170 days after service. She produced a living but very weak calf 220 days after service. The calf was killed before it had nursed, and its organs and the placenta were tested for the presence of *B. abortus*, by guinea-pig inoculations. Both the calf and placenta proved to be infected. The guinea-pigs showed very gross lesions characteristic of the Illinois swine abortion strain.

At the Experiment Station we have undertaken to test whether the abortion bacillus from outbreaks of abortion among swine may cause abortion in a herd of cattle that seems to have acquired herd immunity against the ordinary strains of the abortion bacillus, and if it does, whether the cattle will infect hogs. This work is not yet complete, but has already given results that indicate that a recurrence of abortion may follow the exposure of a herd of the kind defined to the swine strain.

Blood Reactions

The agglutination titer of the blood of infected sows does not usually rise as high as that of cows, and the agglutinins seem to be more tardy in making their appearance.

Infection of Boars

As before stated, Dr. Schroeder and I failed to produce a lasting infection in boars by intravenous injection. We did, however, at a later date, succeed in doing this by injecting the bacilli directly into the testicles. Boars infected in this manner were permitted to serve and to run with sows, but the sows produced normal pigs and agglutination tests of their blood were always negative.

Discussion of Results

The work of several investigators has shown that the organisms responsible for abortion in sows in at least five States are closely related to, if not identical with, *B. abortus*, cul-

turally and serologically. The work of the Experiment Station of the Bureau of Animal Industry has shown that five strains of this organism, isolated from swine, obtained from investigators in four States, differ from one another in their behavior toward guinea-pigs. Yet this difference is in the degree only, and not in kind of lesions produced. All five of the strains, however, differ from all of the numerous cattle strains that we have studied, in the kind of lesions they produce in guinea-pigs. This difference is so marked and constant that we are forced to conclude that if the *B. abortus* isolated from swine is not an actual individual variety it is at least an aberrant type of the bacillus that, in addition to its pathogenicity for cattle, in which it probably originated, has acquired a true pathogenicity for swine, and with this a higher pathogenicity for small experiment animals.

The distinct types we defined are not necessarily as far apart, or as certainly true, separate varieties, as the human and bovine tubercle bacilli, but their differences must nevertheless be clearly recognized, especially as the swine strain of the abortion bacillus, as we have excellent reasons to believe, may, unlike the bovine tubercle bacillus, have the faculty of perpetuating itself through swine.

Most investigators, I believe, who have studied abortion disease of cattle, have found that strains of *B. abortus* vary as to their pathogenicity for guinea-pigs and also probably for cattle. Some strains produce lesions in a relatively small proportion of the guinea-pigs inoculated, and in these the lesions are confined to the spleen. Some produce lesions in practically every guinea-pig inoculated, affecting spleen, liver, epididymides, lymph glands and bones, and in a few instances the lungs and kidneys. Long cultivation on artificial media seems to reduce its virulence for guinea-pigs, though with some strains the reduction does not seem to be marked. We have a strain, isolated from a cow more than a dozen years ago, which has been kept alive in guinea-pigs and on culture media, and is still pathogenic for guinea-pigs. The organism seems to be able to accommodate itself to varying conditions, as is shown by the fact that nearly everyone who studies it has his own particular culture media or method of growing it. It can be made to grow luxuriantly under an atmosphere containing a normal or reduced percentage of oxygen, or in one containing a large percentage of carbon dioxid.

Our work has shown that the pathogenicity of a strain of swine *B. abortus* which has grown on artificial media for some time is increased for both swine and guinea-pigs by passage through sows. Is it not therefore likely that a strain of *B. abortus* nonpathogenic for most sows, but barely pathogenic for an unusually susceptible one, might be passed on by her as a much more virulent one? The organism seems to be a strongly mutating one, and the evidence indicates that, in addition to the strains already pathogenic for swine, there are others, among the many strains of widely varying potency which attack cattle that may become so, if opportunity offers. Outbreaks of abortion among cattle, due to aberrant or unusually virulent types of *B. abortus*, should be carefully watched.

In the guinea-pig test we seem to have a means of differentiating *B. abortus* organisms that attack swine and cattle from those that attack cattle alone, almost as certainly as we are able to differentiate the different types of tubercle bacilli from one another. It will be well worth while if investigattors who have opportunity to do so should by means of this test determine whether the organisms affecting the swine and cattle on the same farms are both of the swine type, and also to test as many strains isolated from cows as possible, to determine how common the strain pathogenic for swine is. If this is done, data that may be of great value in the study of the swine abortion problem will soon be available.

Control

The work of Connaway and others and that of the Experiment Station of the Bureau of Animal Industry has proved that when *B. abortus* attacks swine it behaves much the same as when it attacks cattle. It is harbored in the udder, may reappear in the uterus at a subsequent pregnancy, may be present in the fetal membrane and discharges at an apparently normal parturition, and it is communicable through ingestion. Whether the boar is a greater factor in the spread of the disease among sows than is the bull among cows has not been proved, but the work thus far done indicates that he is not. It follows, therefore, that the same measures recommended for the control of the disease among cattle should be recommended for its control among swine. But there is one additional control measure which must now be used for both species of ani-

mals, and that is the protection against possible infection passing between them.

The food habits of swine would tend to make them more liable to pick up infection than cattle would be, but it should be easier to eradicate the disease from swine, provided communication with cattle harboring *B. abortus* for both species of animals could be cut off, because of the rapid maturity of swine and the ease with which pregnant sows can be isolated. Since pigs are probably immune, it ought to be possible to develop soon a clean herd from an infected one by keeping the young pigs intended for breeding isolated from the infected stock after weaning.

In localities in which bovine infectious abortion is present among swine the stock breeder needs to guard against abortion coming to him through two species of animals instead of one. The purchase of either infected cows or infected sows would likely mean that both species of animals on his farm would soon become infected. In bovine tuberculosis we have somewhat the same, though a more complicated problem. Tuberculosis of hogs is nearly all contracted from cattle, the hogs not being able ordinarily to pass the disease on to other hogs; but we have every reason to believe that the *B. abortus* that attacks swine is perpetuated in both swine and cattle.

VACCINATION

It is very questionable whether the use of living swine abortion bacilli as a means of vaccination against swine abortion is justifiable. The chances of carrying this type of abortion bacillus to farms where it does not now exist are too great, and besides, it is a poor policy to take liberties with an agent about which little is known as to its possibilities for evil. That some strains of swine abortion bacilli are very potent agents Dr. Schroeder and I, because of our experience with them, have become convinced.

It is to be hoped that we shall eventually have a safe and efficient method of vaccination against this disease, but that time has not yet arrived; and until it does, it will be far better to expend our efforts in trying to eradicate the disease by other means than to use an agent about which we know so little and which may possess great possibilities for evil.

I believe that it is a common practice with some producers of bovine abortion vaccine to use a number of strains of *B. abortus*

in its preparation, probably in the hope that one of the strains will be identical with or closely related to the one against which it is proposed to vaccinate. There is danger, even if a single strain of the organism is used, that it may be pathogenic for hogs. This danger is multiplied by the number of strains when mixed strains are used. Any strain of *B. abortus*, no matter what its source, intended to be used in the preparation of bovine vaccine, should be tested on guinea-pigs to make sure that it will not affect swine. Otherwise there is always the danger that the user of such vaccine, in his efforts to reduce the losses from abortion among his cattle, will introduce an organism into his herd that will attack both his hogs and his cattle. Vaccination against *B. abortus* disease is still in the experimental stage, and therefore the use of *B. abortus* vaccine can not yet be recommended.

Summary

I believe that I am justified in saying that the following points have been proved by the work of several State experiment stations and that of the Experiment Station of the Bureau of Animal Industry:

1. That the organism which causes a large share of the abortion among swine is an aberrant or extra virulent type of *B. abortus;* that this organism causes certain lesions to form in guinea-pigs that are unlike those produced by the organism commonly attacking cattle, and that the *B. abortus* which attacks swine can be differentiated from that which attacks cattle only, by the use of guinea-pigs.

2. That sows become carriers through infection of their udders, and that the infection may reappear in their uteri at subsequent pregnancies, as in the case with cows, and that cattle can be infected with the swine bacillus, at least by intravenous injection.

It also seems probable, though not as yet definitely proved, that cattle and swine are equally susceptible to the swine bacillus, and that the organism originated in cattle; also that young pigs bear the same relation to infection that calves do.

That swine abortion is a grave menace to the swine industry seems clear. It apparently has not yet become general, but is evidently spreading fairly rapidly from several centers in several States. Surely intelligent efforts directed toward its control, or, better, eradication, expended now, will be richly rewarded.

THE CONTROL OF EQUINE INFECTIOUS ABORTION IN THE UNITED STATES ARMY [1]

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AT THE 1920 MEETING of this Association in Columbus, Ohio, one of us [2] reported the occurrence of infectious abortion among Army brood mares at the remount depots located at Fort Keogh, Mont., Fort Reno, Okla., and Front Royal, Va. Subsequently regulations for the control of the disease had to be applied at Fort Robinson, Nebr., because brood mares had been shipped to that depot from Fort Keogh. In the report mentioned it was pointed out that between October, 1919, and April, 1920, a total of 83 colts were lost as a result of the infection. It was further shown that a bacterin prepared by the Army Veterinary Laboratory was giving very gratifying results in the control of the malady.

Since the time of the report at the Columbus meeting this work has been continued and further study given several phases of the problem. In the present paper it is desired to summarize briefly the results to date.

Following the favorable results obtained with the bacterin as a prophylactic agent, the administration of the same to all Army brood mares became a routine procedure. During the years 1920 and 1921 only mares in foal were treated. Beginning this year (1922) all brood mares at the remount depots, whether in foal or not, and all stallions, received the treatment.

The Bacterin Treatment

In our early work two types of bacterin were employed, the one administered to pregnant mares containing only one-half the number of organisms per cubic centimeter as that given to nonpregnant animals. Six injections, five days apart, constituted the course of treatment. Our later investigations, however, indicated that there was but very little danger of producing abortion with the full-strength bacterin. Further, as in

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

[2] Kelser, R. A. Equine infectious abortion. Jour. Amer. Vet. Med. Assoc., June, 1921.

our experience abortions ceased after the second inoculation of bacterin, it appeared that the number of injections could be safely reduced. Consequently in the latter part of 1921 we commenced to use a bacterin containing 1½ billion organisms per cubic centimeter (the two types formerly employed contained respectively 1 and 2 billion organisms per cubic centimeter) and reduced the number of injections to four, administering 1, 2, 4 and 6 cubic centimeters respectively, at five-day intervals. While we reduced the number of injections, it was decided to give two series of treatments during the period of gestation rather than one, the first series to be given in the fourth month of pregnancy and the second in the ninth month.

Thus, present regulations for the control of the disease at the remount depots provide that all brood mares, whether pregnant or not, and all stallions, shall receive two series of four doses each of infectious abortion bacterin annually. Any newly purchased brood mare or stallion received at a remount depot is given the first series of treatments without delay, preferably during the usual quarantine period. Thereafter such animals receive the treatment annually with the others. Interruption of a series by transfer to one of the other depots vitiates the treatment already started and the course is commenced anew at the new station. When an animal which has received one complete series is transferred to another station, a second series is not given until the regular time for the routine treatment of all animals.

Results Following the Bacterin Treatment

During 1920 there were foaled at the depots where infectious abortion existed a total of 195 full-term colts. There were 73 abortions shown to be due to *Bacillus abortus equi* and 26 abortions from all other causes. This constituted a loss of 24.82 per cent of the entire colt crop of these depots, due to this infection. The great percentage of these abortions occurred in the early part of the year before the bacterin treatment was started.

In 1921 the total number of colts born at full term was 228. There were but two cases which proved to be infectious abortion, and 13 abortions from other causes. Thus, but 0.82 per cent of the 1921 colt crop was lost as a result of the disease. The two cases that did occur were both at the remount depot at Front Royal, Va.

Thus far the figures for 1922 indicate that 149 full-term colts have been foaled. There has been a total of 6 abortions of non-infectious type, but not a single abortion which could be attributed to *B. abortus equi.*

These figures speak for themselves, requiring no further explanation.

As previously indicated, the bacterin injection is well borne by the animal. To date over 1,500 treatments have been given, and so far as those who have administered the same can tell, no abortions or other ill effects have resulted therefrom. In the fall of 1921 an affection among the brood mares at the Fort Robinson depot was reported as possibly due to the bacterin injection. Investigation, however, proved the ailment to be infectious anemia, and in no way associated with the bacterin treatment.

EFFECT OF BACTERIN TREATMENT ON SUBSEQUENT COMPLEMENT-FIXATION TESTS

Another point studied in connection with this work was the effect of the bacterin injection on subsequent complement-fixation tests for the diagnosis of the disease. Several thousand specimens of blood serum, taken at different periods from animals inoculated against the disease, were subjected to the serological test. The results obtained indicate that serum specimens from the vast majority of animals thus inoculated give positive reactions to the test, and that their serum will continue to give such reaction for several months.

The complement-fixation test, therefore, is of but little value when employed with vaccinated animals. However, as pointed out in the report at the Columbus meeting, the complement-fixation test, while highly valuable in establishing the presence of the infection in a particular group when a number of animals are tested, is not to be relied upon in diagnosing the disease in individual animals. This conclusion was based on the finding of aborting mares whose blood serum gave negative reactions to the serological tests while the specific organism of the disease was demonstrated in large numbers in their vaginal discharges and fetal membranes. Thus the loss of the use of the complement-fixation tests with animals which have been inoculated against infectious abortion is not a serious loss, because the greatest value of the test with animals among which the disease

has previously occurred would be in identifying individual cases.

Anti-Abortion Serum

In our early work an antiserum was prepared against *B. abortus equi* with a view to employing the same, either alone, or simultaneously with the bacterin, in the event it was found that the larger doses of bacterin would produce abortion in pregnant mares. As no such trouble was experienced, the preparation of the serum was discontinued.

Conclusions

Equine infectious abortion, due to *Bacillus abortus equi*, can be effectively controlled by the use of properly prepared bacterins.

Mares, even though in advanced pregnancy, suffer no ill effects from the administration of equine infectious abortion bacterin.

The bacterin treatment renders the complement-fixation test for the diagnosis of the disease practically valueless with animals thus treated. However, this is not a serious consequence, in view of the fact that the serological tests can not be considered reliable in diagnosing the disease in individual cases.

APPROVE TUBERCULOSIS CURE

The British Red Cross, after careful investigation, has decided to purchase the vaccine treatment against tuberculosis originated by Henry Spahlinger, the Swiss biologist, and a contract for the sale has just been signed in London.

The Spahlinger laboratory will be continued and others will be established. A number of American patients, many of them advanced cases and some given up by physicians, are now under treatment in Switzerland and all are reported to be showing improvement.

The Spahlinger discovery was announced in Paris early in 1914. Little more was heard of it until after the war, but within the last year or two it has attracted considerable attention, notably on the part of the British scientists and officials. The serum can now be made, it is stated, as cheaply as the ordinary smallpox vaccine.

THE X-RAY IN CANINE PRACTICE [1]

By GEORGE P. FROST
Chicago, Illinois

TO THE SMALL-ANIMAL PRACTITIONER the X-ray is as useful, and I may say as great a necessity as it is to the physician. In the correct diagnosis of fractures, determining the position of broken bones, the types of fractures, the X-ray is well worth the trouble and expense to which its use puts the practitioner. There is a great scarcity of literature on the use of the X-ray in veterinary practice; in fact that is the chief reason for bringing up the subject for discussion. The small-animal practitioner who makes use of the X-ray in his work should come forward and give the profession the benefit of his experience.

I first became interested in the X-ray by having some personal fractures photographed, having thus become satisfied that it was practicable to use in canine work. I then canvassed several X-ray laboratories until one was found that would do the work after office hours.

Since the automobile has come into such common use injuries to dogs, consisting of fractures and luxations, are becoming very common in canine practice. This brings before us the advantages which we obtain from the use of the X-ray in those accidents, particularly in injuries of the long bones of the legs, ribs, and especially also of the pelvis and the skull.

With the aid of the picture the exact condition of the bones can be determined, and this also shows the manipulations necessary to reduce the fracture. It does away with all guesswork on the part of the operator and allows him to make a correct diagnosis and prognosis of the case.

Another angle from which to view the usefulness of the X-ray in small-animal practice is from the point of view of the owner. It educates the owner regarding the fact that you are a scientific man and not simply a dog and cat doctor, as so many kennel men claim to be.

As an advertising medium it is a success. Many owners like to talk of the ailments of their pets and are glad to spread the

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

information among their friends that their doctor had an X-ray picture taken of some part of their pet's anatomy, and that they had seen the picture of the injury. This brings us a lot of effective and desirable publicity at a small cost.

In hip-joint dislocations the X-ray shows whether luxation is simple or complicated with fracture of the head of the femur. In simple luxations the exact relationship of the affected part and adjacent structures is revealed so that we can easily decide how and where to apply traction in order to obtain desired results.

Other very common injuries that we meet with in dogs and cats are affections of the phalanges due to bites. When we receive such cases in our hospital we usually find a badly swollen paw, with several fistulous openings—conditions caused by a diseased phalanx. This is another class of cases where the X-ray is of great help. As a means of locating the character and position of foreign bodies in the stomach and intestines the X-ray is invaluable.

The average dog is very easily handled under the X-ray apparatus. To obtain a picture of the pelvis or the femur, place the patient upon its back on the plate, flex its legs, have the operator bring the machine into the proper position over the subject, talk to the animal and soothe the patient all the while, and you will find that nine times out of ten you will obtain a perfect picture.

In photographing medium-sized or small dogs, place them on their backs with their heads held in the hollow of your arm, holding the dog's left hind paw with your left hand, the right hind foot with your right hand, flexing both of the subject's legs and spreading them slightly so as to steady the patient.

As to the financial side of the business: We can not expect very substantial rewards at present; first, because the work is new with dog owners; second, a majority of our patrons can not afford to spend much money on their pets; third, the more reasonable the charge, the more frequently will we be able to interest our patrons in the benefits to be derived from the use of the X-ray. Laboratories charge from $3 to $5 for a picture.

A case that serves to illustrate the point was in a mature Boston terrier that was brought to my office by Mr. N. The history given was that he had found the dog while driving in the country; that the dog carried its right hind leg flexed and

would not bear weight on the member. Manipulation of the parts failed to reveal evidence of fracture and caused no manifestations of pain. The X-ray showed complete displacement of the head of the femur. Reduction was effected under anesthesia, a plaster cast was applied beginning at the hock, covering both hips and extending forward to the lumbar region.

DISCUSSION

CHAIRMAN FLYNN: Dr. Frost has the distinction of presenting the first paper to the veterinarians on the use of the X-ray, and he has some pictures he will exhibit.

(Dr. Frost exhibited X-ray pictures of various fractures, etc.)

CHAIRMAN FLYNN: Are there any questions you would like to ask Dr. Frost?

DR. W. H. KELLY: I had a case of a fox terrier that had a wound on the pelvis that had been there about a year and would not heal. I took the dog to the hospital and had an X-ray taken and found the dog had been spayed, and the person who did the operation used a probe to locate the uterus, and the probe was left in for a year. The X-ray showed the probe. I immediately removed the cause and had good results.

I had another case of a dog that had trouble in the left legs. I had an X-ray picture taken and it showed a complete fracture of the radius, and the other was a greenstick fracture. I am sorry I haven't the pictures with me. I recommend the X-ray for diagnostic purposes.

A magazine writer says the dog fills an empty space in a man's life. This is especially true of the hot dog.—*Hartford Times.*

The one-hundredth birthday of a Belgian veterinarian, Dr. Benoit Demol, was recently observed with a celebration in which his professional brethren and fellow townsmen honored him. He entered the Government Veterinary School at Cureghem in 1844, soon after its organization, and graduated in 1848.

The problem of bovine tuberculosis from the standpoint of human health has recently been taken up in France, following a request by the Council of Hygiene of the Department of the Aisne asking the compulsory application of the tuberculin test to cows whose milk is sold to the public and demanding that all cows with positive reaction be sent to the slaughterhouses. This proposition was not accepted by the Academy of Medicine, it being stated that the only way of warding off the transmission of tuberculosis by milk was to boil the milk.

GASTROENTERITIS IN SMALL ANIMALS[1]

By O. V. Brumley

Professor of Veterinary Surgery, Ohio State University, Columbus, Ohio

THE SUBJECT of gastroenteritis is one of great importance to the practicing veterinarian because the condition presents many difficulties both from the standpoint of an accurate diagnosis and the application of proper treatment. Owing to the various kinds of food taken by small animals and the fact that such food often contains either foreign substances or preformed toxins, this condition is of very frequent occurrence.

In many cases in small animals it is wise and advisable to consider the condition from two distinct standpoints, namely, gastritis and enteritis. A large number of cases present typical symptoms of a gastritis without any involvement of the lower portion of the intestinal tract, while on the other hand the opposite is true, the intestinal tract being of primary importance. In considering this condition it is well, therefore, to keep in mind some of the more common factors producing the various degrees of inflammation and intoxication.

1. We believe that errors in diet, from the standpoint of either too large a quantity or improper quality of food, produce a large number of cases presented to us in practice for treatment. Frequently animals are presented to us for treatment with a history of loss of appetite, vomiting, etc., and upon investigation this condition is found to be due to some irregularity in feeding or in the kind of food given. It is often observed that the eating of food containing preformed toxins, such as from decomposed cadavers, produces a very serious form of inflammation of the entire digestive tract. It is very difficult to keep small animals from ingesting such substances, and during the warmer months of the year we may expect many cases of gastroenteritis from this source.

2. The condition is often brought about by various toxic substances. It is very common, I find, to have small animals poisoned, accidentally or intentionally, by one of the corrosive poisons—carbolic acid, corrosive sublimate, phosphorus, arsenic,

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

and some of the various combinations of rat poisons. These constitute a very common source of the trouble. These materials when taken by small animals naturally produce a serious form of the condition, and as a rule the entire digestive tract is affected. In some districts powdered glass is very frequently administered to produce inflammation of the intestinal tract and ultimately bring about the death of the animal. It is common to observe symptoms of poisoning in a whole flock of birds as a result of sodium chlorid or some similar substance given to them in too large a quantity with the food. Our observation has shown that in these cases an intense gastroenteritis is the usual postmortem finding. In the consideration of this condition in small animals, therefore, it is very important that these substances be taken into consideration early in making a diagnosis, so that proper treatment can be applied, and, if possible, to counteract the poison present.

3. Some cases of gastroenteritis are produced by administering foods that are too hot and when swallowed produce congestion of the membranes, which may lead to an inflammation. Many of such cases confine themselves to the anterior portion of the digestive tract.

4. In dogs and cats we find a very serious form of the disease as a result of specific infections. Many cases of distemper in these animals have their primary focus of infection in the digestive tract. A large number of the cases of distemper in dogs begin with the symptom of loss of appetite and vomiting. This indicates to us that the primary focus of infection evidently is to be found in the stomach. It produces a gastritis and may also involve the lower portion of the tract. I think most practitioners will recall many cases of this kind, which might easily be mistaken for some other type of gastroenteritis. When the case is considered suspicious of being distemper, have the animal quarantined for at least a few days in order to make an accurate diagnosis, especially to eliminate the possibility of its being this disease. In cats there is at present throughout the country a disease which has caused a great deal of trouble. It is no doubt a specific disease in which the infection begins in the digestive tract and ultimately ends in a severe form of gastroenteritis. In some districts it is becoming very difficult to raise these animals on account of this particular disease. I think it is wise, therefore, always to

consider gastroenteritis in these animals from this standpoint and keep them in quarantine in order to avoid infection of other animals. I think most of the hospitals for small animals in this country have had considerable experience with this specific infection in these animals. Other infections, no doubt, play an important part in the production of some forms of gastroenteritis. It would seem, therefore, that this etiological factor should be considered seriously when making a diagnosis in these small patients.

5. Practically all small animals have certain species of parasites. It has been our experience that some of these species of parasites, at least, produce rather serious disturbance in the digestive tract. Aside from the mechanical interference with the function of these organs, it is no doubt true that certain excretions from the parasites lead to irritation of the membranes and in some cases to general intoxication. Other species of parasites produce direct irritation to the membrane, causing, eventually, inflammation, thickening of the membranes and marked general disturbance. All cases presented that show a low-grade inflammation should always be examined for parasites. This condition is observed in all species of small animals, especially where animals are segregated. It is wise, we believe, to make a regular practice of examining them for parasites in order to avoid later trouble from the standpoint of either gastritis or enteritis or both.

6. It has been a disputed question whether or not the subjection of these animals to extremes in temperature will produce gastroenteritis. We have had quite a few cases which showed evidence of the condition, and as far as could be determined no other etiological factor was present. Perhaps reduced resistance, as a result of the exposure, plays the most important part in the production of the condition. Naturally, the reduced resistance would allow infection to take place, would disturb the normal function of the organs, and perhaps, as a result of this, gastroenteritis would be brought about.

A great many other conditions might be enumerated which no doubt have something to do with producing gastroenteritis, but we believe we have named the more important things that should be considered from a practitioner's standpoint. The reason for mentioning these different factors is that when a case is presented for examination and diagnosis we should keep

in mind the various possibilities that will produce such a condition, and, if possible, find out the specific cause. Naturally many cases will be presented to the practitioner where a diagnosis is impossible, but we should try to reduce this number to a minimum. The more accurate the diagnosis can be made, the more successful we will be in controlling the conditions that are presented and also in many cases in protecting other animals from infection, etc.

SYMPTOMS

Vomiting occurs early and is one of the most prominent symptoms, especially when the stomach is primarily involved. This symptom is of very frequent occurrence in the most severe forms of the condition. In the early stages the vomitus consists of undigested and decomposed food material covered with mucus, streaked with blood and having a disagreeable odor. The odor in these cases is characteristic of that form of gastroenteritis produced by ptomaines or decomposed food. In some cases when due to chemical causes the odor of the poison will be detected. It is often observed that specific poisons produce more or less characteristic odors when decomposed or chemically changed. As the condition continues the vomitus will consist almost entirely of mucus, sometimes mixed with bile. When only the stomach remains affected, these may be the most prominent symptoms.

Most cases of severe gastritis are usually followed by involvement of the intestinal tract. Our experience has shown that it is very difficult to distinguish between gastritis and enteritis, especially when it is produced by ptomaines, chemical poisons or specific infection. As a matter of fact the entire tract is usually affected. When the lower intestinal tract is involved the symptoms will vary with the intensity of the cause and the part affected. In the milder cases the symptoms are those of diarrhea due to functional disturbance of the bowels. In severe cases this symptom is present and the discharges are usually mixed with blood. The latter condition is observed particularly in the cases of poisons and specific infection in all the small animals. The odor of the drug may be present. Severe abdominal pain is a prominent symptom when either the stomach or the intestines are involved. The severity of this symptom will depend somewhat upon the cause and also upon the temperament of the individual animal.

In birds gastroenteritis is usually ushered in by a marked diarrhea with admixture of considerable blood with the discharge. This is especially true following such conditions as cholera or chemical poisoning.

A chronic type of inflammation of these organs is of frequent occurrence and in most cases is evidenced by loss of appetitite, or it may be variable, constipation and diarrhea alternating. The general condition of the patient is usually bad, the animal showing more or less emaciation and general cachexia. A distinction should be made between the acute and chronic form of the condition, and this is usually not difficult when the history of the case is taken into consideration and the symptoms shown by the patient. We have found quite a variation in the symptomatology of gastroenteritis, due mostly to variation in the etiological factors.

The diagnosis of acute gastroenteritis is not difficult from the standpoint of determining the presence of a severe inflammatory condition. The determination of the etiological factor producing the condition sometimes presents considerable difficulty. It is always advisable to determine, if possible, the cause of the condition so that proper treatment may be applied. We have found it to be highly desirable to examine all of the discharges to find out, if possible, the definite contents and the probable condition of the intestinal mucosa. In as much as the causative factors are so varied, we do not believe it possible to treat such cases successfully unless the diagnosis is established from this viewpoint. We will all agree, however, that there are many cases where the exact causative agent can not be found. The treatment, it seems to me, depends to quite an extent upon the cause producing gastroenteritis.

In making our examination of the patients we should also take into consideration palpation over the region of the stomach and bowels to note the degree of sensitiveness, fullness, etc. In all cases of gastritis, pain will be shown on palpation in that region. This is also true when the lower portion of the digestive tract is affected. The temperature is a good indication of the progress of the disease and forms an index as to the cause. A normal temperature should not be considered a favorable sign in all cases, because it might be just at the point of dropping to subnormal. A careful examination is advisable in all cases in order to make the diagnosis as accurate as possible.

TREATMENT

In the early stages of the condition, especially with strong patients, all food should be withheld for at least 24 to 48 hours, and then food should be given only in small quantities in an easily digested form. This should be observed for several days following the inception of the condition. In weak individuals small amounts of beef broth or milk may be allowed unless it produces vomiting. The diet of our small patients during the course of such a condition is very important on account of the deranged function of the mucous membrane. Perhaps it is advisable to eliminate all food for at least two days in most of the cases.

When only the lower portion of the digestive tract is involved the animal usually has a good appetite and considerable food will be taken, only to produce disturbance after it passes through the stomach. Therefore, such cases should be particularly watched from the standpoint of diet.

Medical treatment will depend a great deal upon the condition found upon examination. The use of an emetic is indicated in the early stages of poisonings, etc., in order to empty the stomach and prevent the toxic substances from passing on down to be absorbed and produce general intoxication as well as inflammation of the lower part of the digestive apparatus. We have found apomorphin to be the most dependable preparation, especially for dogs and cats. The dosage should be carefully considered on account of the depressing effect of a too large dose. Following this treatment I would recommend irrigation of the stomach with a 2 per cent solution of sodium bicarbonate. The object of this treatment is to remove irritating material from the stomach and also to correct extreme acidity that may be present. We have found that a practical way of introducing the solution is by the use of a small rubber tube which is inserted into the stomach with a funnel attached to the free end. The solution can be introduced in any quantity desired. By depressing the end of the tube the fluid can be syphoned out. It is advisable to allow the fluid to remain in the stomach a few minutes in order for it to mix with the contents and to dissolve the mucus. This operation should be repeated until the solution comes away clear.

Following this treatment I would recommend the use of stomachic tonics. For this purpose there is a wide choice of preparations. Iron and quinin citrate have given us good re-

sults. Tincture nux vomica or gentian may also be used for this purpose.

When the intestinal tract is also affected I would recommend the use of purgatives, preferably castor oil or magnesium sulphate in sufficient doses to remove all irritating material from the tract. After a free cathartic action, the administration of astringents and styptics is advisable. If the condition is found to be due to certain definite causes, then the treatment must be applied to counteract those things. It is rather difficult to prescribe definite treatment in all cases because of the many variations in the etiological factors. We as practitioners should particularly observe these facts in treating all cases showing evidence of gastroenteritis.

In many cases of this condition it is advisable, in dogs, to wash out the entire intestinal tract with a soda solution followed by an astringent antiseptic such as tannic acid, iron sulphate, etc. When this operation is performed it is advisable to introduce these solutions in dilute form in 1 to 1½ per cent. This operation is performed in most cases without much difficulty by the introduction of a flexible rubber tube with a funnel attached to the free end. The solution is poured into the tube and allowed to gravitate slowly into the bowels. When no obstruction is present the fluid will flow into the stomach and be ejected through the mouth. In birds a small syringe is preferable. The amount of fluid to introduce will depend upon the condition. This method of irrigation can be modified to suit conditions. We found several cases that responded readily to treatment after this operation had been performed. In very weak individuals normal salt solution may be introduced by the same method to produce general stimulation. Stimulants may also be given in dilute solution in the same manner.

In chronic cases treatment must be varied according to the condition. We have found the same general line of treatment advisable, but it must be modified according to the needs of the patient.

We must consider the various forms of gastroenteritis in our small patients as being serious and handle them with the utmost care in order to accomplish good results. I think the important thing in all such cases is an accurate diagnosis if it is possible to make it. At any rate, we do not believe rational treatment can be applied without knowing rather definitely what the conditions are.

DISCUSSION OF PAPERS IN OCTOBER JOURNAL

Some of the papers presented at the recent A. V. M. A. convention were published in last month's JOURNAL, but up to the time of going to press with that issue the official report of the discussions which followed those papers had not been received and could not be published along with the papers. Those discussions are therefore printed herewith.

DISCUSSION OF PAPER ON "THE HANDLING OF THE FISTULA OF THE WITHERS IN PRACTICE," BY B. W. CONRAD.

(*See Paper in* JOURNAL *for October*, 1922, *page* 37.)

DR. H. E. BEMIS: I am sure we are all interested in this very practical and well prepared paper. Probably most of us treat fistulas as a matter of necessity rather than choice. Nevertheless I have found a great deal of satisfaction coming from these operations when they are carefully done, as Dr. Conrad has outlined.

Regarding the cause of fistula, Dr. Conrad stated that it was immaterial, but I think it is important from one phase of the subject. I believe that oftentimes there are conditions on the premises which bring about a large number of fistulas in that particular place. We often get history of low sheds, or in Iowa, where we have timber pastures, overhanging limbs which the animals come in contact with, and we think in some cases at least we have been able to control apparent outbreaks (if I might speak of it in that way) of fistula of the withers by removing those conditions which we think are causes of this condition. I believe it is important for the practitioner to help his client out in trying to prevent this condition from occurring.

In regard to the operation, I certainly agree with the author of the article in the fact that the patient should be thoroughly prepared and completely controlled. There is no excuse for operating under any other conditions. Of course, the circumstances, as he stated, will modify the method of control to some extent.

Regarding the operation, I think that the supraspinous bursa is almost invariably the seat of the original inflammation, and in most cases you will find that a drainage opening just underneath the rhomboideus muscle will drain that area. My particular point in making the lateral incision is to get to the deep face of the rhomboideus muscle without going through the deep layer of fascia which immediately underlies it. That drains the process in most cases but does not go through the underlying fascia, which, if opened, in some cases allows migration into the deeper layers of the neck. Furthermore, I like the median line incision over the top of the withers in most cases, because then I have an easy access directly down upon the process and can explore it both from above and from the side, and I feel that I can do a more thorough operation in finding exactly the depth of the pocket and in removing all of the diseased tissue.

CHAIRMAN MULDOON: I would like to take the liberty of asking Dr. Ferguson to talk on the subject.

DR. T. H. FERGUSON: I didn't hear either one of the doctors mention draining tubes in connection with the operation. I have had some little experience with handling fistula of the withers. The first

ten years I used to play with caustics and never got very good results. The last sixteen or seventeen years I have been doing the median line operation, and my procedure is about as follows: If the horse has high withers, I don't extend the incision back over the high part of the withers. If on the other hand the horse has low withers, I extend it back farther; but if the necrotic ligament extends back involving the supraspinous ligament, or the hind part of the withers, I dissect that out subcutaneously. Where the condition is caused by some injury to the dorsal vertebra at the highest part of the fracture or an injury to the cartilage of prolongation—we get those cases, and sometimes there is an enormous swelling on each side from a fracture, and that swelling is filled with serum and has dissected its way back under the rhomboideus muscles and back between the cartilage and the withers, and there is more or less diseased tissue back there—I make the incision well forward just the same, and then dissect out as far back as I can subcutaneously, and then very often I use a drainage tube. If both sides are affected, I use the drainage tube, but instead of applying it laterally across the neck I place it in between the cartilage of prolongation and the high point of the withers, making the opening posteriorly and letting it protrude anteriorly and under the rhomboideus muscle. That drains them out quicker than any other method that I have used. As soon as you make a good, big incision, remove the necrotic ligament and keep the wound clean for a few days; give it a good start and keep it clean afterwards. By letting the air in, nature will slough out any little necrotic tissue that you happen to miss incising, and you get perfect drainage that way.

In other cases I just put the tube in laterally, from above down through and under the muscle on one side, and the same on the other. I use a half-inch rubber tube that is perforated. I have operated and not used the tube, but I find that I get better results by using a perforated tube. Those tubes are not hard to keep clean if you use a good, long tube and perforate it just through the center. In cleaning them we use one of those hair brushes similar to the water-bottle brushes.

We find in our practice that the majority of cases of fistulous withers start in the supraspinous bursa just above the second dorsal vertebra or along in that region, above and a little anterior to it. Occasionally, however, an entry of the posterior angle of the cartilage of prolongation or fracture of the vertebra will cause a large swelling and an accumulation of fluid that will keep seeking the least resistance until it is apt to form away back almost to the saddle seat, and sometimes away ahead. Those cases are rather confusing until you withdraw the fluid and make your incision and explore may be with the hand or with instruments, when you can determine the exact condition. Of course if the cartilage of prolongation has been broken or part of the scapula has been broken, it is necessary to remove the fractured part. If it is partly attached, it is often necessary to separate it with a knife or saw. In case of a diseased vertebra or a diseased shoulder blade, curetting lightly is better than curetting deeply, because nature will exfoliate that diseased part better than we can do it, and if we cut it off or curette it off too much, she is doing to exfoliate it just the same. So it is better to rely on nature doing it, as she will do a better job than we do. If you provide drainage, let the air in and remove most of the necrotic material.

I have found that the majority of cases will do well with just the one operation, and it is the most economical way for the owner. The one job takes care of it if it is well done.

DISCUSSION OF PAPER ON "DISPENSING AS AN ASSET TO THE VETERINARY PRACTITIONER," BY CHARLES W. BOWER.

(*See Paper in* JOURNAL *for October*, 1922, *page* 39.)

DR. HAMLET MOORE: I probably have a little advantage over the average veterinarian in the line of dispensing. I am a graduate in pharmacy and served ten years in the drug business. I conduct a pharmacy of my own that is equipped with all the best and latest drugs that are on the market. But there are things in Dr. Bower's paper as to which I differ with him.

People come into my office and ask for a bottle of cough sirup or worm medicine for a dog. I have yet to put up my first bottle of medicine or bottle of tablets or anything else. I simply make the statement that I will not prescribe without seeing my patient. I can see the disadvantage of that in this way: If you begin to put up medicine when a man comes in and asks you for it, you will soon be sitting in your store putting up medicine in place of making calls.

I make as much money on my medicine as anybody, because I was taught when young to get the money, though I am not on the order of the man who said his father told him, "Get it honestly if you can, but get the money." I figure on getting mine honestly. I do not believe in counter prescribing.

One day last week an Italian came to me and said, "You treated this mule for us so long ago. She has got exactly the same condition as she had when you treated her before." I said, "Well, I am not taking your diagnosis for it." He said, "Doctor, if you don't, we don't think your treatment is right." I said, "I am sorry for your diagnosis, but that is my position." The man went home and said to his father, "Dr. Moore won't sell us that medicine." His father said, "We have got to have him; telephone for him." He telephoned, and I went down there. I got $8 for the case and $2 for the medicine. Now I could have sold him that medicine for $2 and I would be $8 short. That condition prevails all the time.

As I said, I am a druggist. I have worked in the drug business from the Atlantic to the Pacific and from the Lakes to the Gulf. I have worked in only two drug stores—one in Boston and one in New Orleans—where substitution was prohibited.

When the average man or woman brings a dog to me I usually find they have given it castor oil and vermifuge, and sometimes I ask, "Why don't you give it a paint douche and finish it up?" The average man who thinks his dog has worms will give "———'s vermifuge," and there is no remedy on the market that is as disastrous as that. This vermifuge gives me more practice than all the rest of the drugs on the market put together.

You simply have got to undo what the druggist has done. I make it plain to my client that this dog is in a condition that I have got to undo what has been done before I can adopt treatment. I tell them, "I am going to do what I can for you and promise you nothing."

Dr. Bower brought out one very good point about the bottle and the label. There is not a veterinarian in the city of New Orleans besides myself who uses a bottle unless it is an embalming fluid bottle or a beer bottle. There is not a veterinarian in the city of New Orleans who doesn't write a label that he can hardly read himself. I put a typewritten label on mine. They will dispense tablets that you can't tell whether they are whitewashed or chrome yellow, and take a card and write with pencil on it: "Put one tablet in a quart of water and give him fifteen drops when you think of it," or something of that kind.

If the veterinarian will adopt the system of putting up his own medicine, the precautionary measure of Dr. Bower's is probably very fine; but I don't suppose that there are three men in this body who have such a variance of prescriptions that they can't remember. A short time ago a man who has a kennel club said, "Doc, what do you use for a dog?" I said, "It makes a lot of difference; it depends on what is the matter with the dog." He said, "Well, So-and-So said if your dog has diarrhea, use I. Q. and S.; if he has constipation, use I. Q. and S.; sore throat, I. Q. and S.; lame in the left hind leg, I. Q. and S." He went through for a long time and gave I. Q. and S. I don't believe there are more than three men in here who have such a varied line of medicals that they can't remember them, notwithstanding the fact that I think the precaution is a very good one.

My medicines pay me about $200 or $300 a month. When I first graduated I prescribed because I was in a country town, and I learned several months afterwards that the druggist had a special file for my medicines. He had numbered them and carried them in numbers, and it was only a question of time before somebody from the country would come in and say, "You remember that mule that Dr. Moore treated. Wonder what it was he gave me," and he was prescribing from my prescriptions and taking a chance whether he was right or wrong. I believe the thing to adopt is not to prescribe without seeing your patient. (Applause.)

DR. QUITMAN: Dr. Bower and Dr. Moore struck some very varying points. Dr. Moore, however, while not disparaging entirely, threw just a little bit of cold water on the keeping of prescriptions, under the contention that a veterinarian relies largely on certain pet formulæ. The point that I wish to drive home is that the veterinary profession is making giant strides toward advancement. In the last ten years, in the last fifteen years, and in the last five years it has improved intellectually and has improved physically in appearance, in business methods and all. I agree most heartily with Dr. Bower that every veterinarian, or ninety-nine out of a hundred, dispensing his own medicine should keep a prescription file just as soon as he gets money enough to lay in a stock of drugs, not only for the reasons that Dr. Bower gave—he gave you a number of good reasons as to why you should keep a prescription file—but they are the best legal proof that you can offer in case you are accused of poisoning some animal; and I don't care how innocent you are, sooner or later you are apt to be accused of poisoning somebody's animal. If the horse or dog falls over dead just as soon as you give it a dose of medicine, they are liable to accuse you of poisoning it. If you can show the court that you are careful, that you even wrote a prescription for that medicine, you have an advantage. You can take that prescription into court and it can be viewed by experts on the other side. You want to fill that prescription out, as Dr. Bower said, just as though you were going to the drug store. That will then inculcate into the minds of the court and the jury that you are careful, that you wrote that prescription first and you swear that you filled it according to that prescription.

Then Dr. Moore made allusion to the fact that so many of us use a certain pet prescription that we can remember. All true; have a prescription on file for those; give them a number. I am using today one of my pet prescriptions that I prescribed years ago. Every assistant I have soon comes to know that 208 is our one best seller. Even if I am using regular stock remedies that are put up by the gallon or five gallons, they have a number and that number goes on the prescription. That creates the idea of carefulness.

I think that the majority of points have been covered, except I want to go one point further in the appearance of the packages that are given out. I dispense every bottle with a very neat bottle

cap. The paper bottle caps are corrugated; they are very inexpensive, and you will find that two sizes are all that you need, a No. 4 for small bottles and a No. 6 for large bottles. The small ones cost 35 cents per gross and the large ones 40 cents per gross, and the added appearance that they make to a bottle is worth considerable to you. It attracts attention to your package from the other fellow's package. It makes the client feel that you are careful, that you are neat, and if you are neat, you must be careful. These paper caps are put on either with a turn or two of string, tied neatly, or with a rubber band. They also aid in retaining the cork, so that in careless handling of the bottle by the person taking it away from your pharmacy the cork will not come out.

Another point not mentioned, although alluded to by Dr. Bower, was in refills. Do not refill a dirty bottle or send it back with a dirty label. When a bottle comes to you to be refilled, that bottle should be cleansed, and if the label is soiled, as it is apt to be, put on a fresh, clean label. If the cork is dirty and filthy, put in a new cork or wash that one.

I was glad to hear Dr. Bower say that the dispensing stimulates study of materia medica. I hope he is right. The Lord knows that is one thing that the veterinary profession requires—some stimulus to the study of materia medica. And this thing of using stock prescriptions is the greatest detriment that our profession can have—I mean the practitioner's portion of the profession. While we can not avoid having perhaps half a dozen stock formulæ, in most instances where you examine a patient you should put your medicine specially suited for that case, and in that instance write a prescription and follow out the other points named in Dr. Bower's excellent paper. (Applause.)

DISCUSSION OF PAPER ON "CLINICAL OBSERVATIONS ON CATARRHAL MASTITIS IN THE COW," BY LOUIS A. KLEIN.

(*See Paper in* JOURNAL *for October*, 1922, *page* 25.)

DR. FERGUSON: I would like to ask Dr. Klein a question relative to the treatment of catarrhal mastitis. He states that he usually recommends frequent milking as a feature in treating catarrhal mastitis. I have tried both ways. In some cases of apparently contagious catarrhal mastitis where there was a decided tendency for rapid diminution in the milk supply, in addition to cutting down on the feed and administering carthartics, followed by diuretics, we have had very good success in not milking, letting them miss a milking, with the idea that frequent milking not only milked out the bacteria, but it milked out the leucocytes, and we have to depend in those cases a great deal on the leucocytes for repair or for overcoming the condition. I have handled a number of outbreaks in that way, and I wish to get Dr. Klein's opinion on that one point.

DR. KLEIN: I was not discussing the treatment of the infectious type of catarrhal mastitis. The system that I described has been applied to the treatment of the noninfectious type. I have never tried the plan followed by Dr. Ferguson. I can see reasons for believing that it might be desirable, as he says it would permit the leucocytes to remain in the affected part of the udder, and so take up the offending bacteria. Before I pass on from that point, I would say that Dr. Ferguson has a very good foundation for his treatment in the fact that it is practically the same as the Bier treatment of inflammation. I remember that treatment consisted of putting some elastic bandage around the inflamed part to retain the blood in that part. In working with these cases of noninfectious catarrhal mastitis I have always found the milk to contain an abundance of leucocytes. In fact, the excessive number of leucocytes

persists for some time after the bacteria have disappeared and after the milk has taken on a normal appearance, and after all clinical symptoms of the disease have disappeared. Because of that observation I am not certain that it is necessary to permit the retention of this infected material in the affected quarter. However, I haven't had any experience whatever, or rather very slight experience, in treating the infectious type of catarrhal mastitis. My experience has been very largely with the noninfectious type that occurs in those dairy herds which are forced for high milk production.

UNHOOKING THE HOOKWORMS IN FIJI

The carbon tetrachlorid treatment for the removal of hookworms, developed by experiments by Dr. Maurice C. Hall, is meeting with great success in the Fiji Islands, where it is being used on the natives on a large scale. "Talking of doses," writes a correspondent in Fiji to an Australian relative, "all Fiji is taking carbon tetrachlorid, the new hookworm cure, and a great improvement on the old one of chenopodium oil, which was drastic in treatment and expense. But the American Dr. Lambert, with his assistants, reckons he can do the whole of Fiji for 200 pounds sterling (less than $1,000). The dose seems to me like a tiny bubble of gas in a spoonful of water, which slightly burns (the throat). About six hours after a dose of salts is necessary, and nearly everyone is tons better in health after it."

A number of laboratory animals (rabbits) which had been inoculated with anthrax or bubonic plague in the course of the production of antiserums and vaccines were stolen from the official antiserum and vaccine institute at Naples. It is to be hoped that any resulting harm was limited to the person who committed the theft.

The French veterinary profession is agitating the question of having the national veterinary schools confer the doctor's degree in veterinary medicine or veterinary science instead of the present title of veterinarian. The faculties of the three schools (Alfort, Lyons and Toulouse) have passed a resolution urging the creation of the doctorate and proposing as the most practicable means of accomplishing this that the veterinary schools be attached to the respective universities. The matter is under consideration by the Ministry of Public Instruction.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

OBTURATOR PARALYSIS [1]

By A. R. GALBRAITH
Garfield, Washington

DURING the months of April and May, a number of brood mares in this section of the State (Whitman County) were stricken with a paralytic condition of the hind quarters shortly after foaling. In eight cases that I came in contact with, each one followed dystokia due to an abnormally large fetus, and all of them terminated in death. Five of the mares were my own cases, and I was called in for consultation on the other three. I was not present at the time of foaling of any of the mares. In each case but one the owner and his rural assistants, through the help of block and tackles, wire stretchers and strong arms, removed a dead colt. Within three or four hours, the owner, becoming alarmed at the mare not being able to arise, sent out an S. O. S. for help.

Upon arrival we find the patient down, with use of the fore quarters, but the rear end will not function properly. Some mares, being extremely nervous, especially if it is their first colt, become restless and make repeated attempts to arise, while others, apparently aware that something is wrong, will not try so frequently. After a careful examination has been made to determine whether or not a fractured pelvis or fracture of some other bone is the cause, and after hearing the history of a large fetus and of help being necessary to remove it, one is forced to the conclusion that the paralysis must be caused by pressure on some nerve.

A survey of the anatomy of the hind quarters will show that the gluteal and obturator nerves are the ones we are chiefly concerned with in this condition. The obturator nerve is derived from the ventral branches of the last three lumbar nerves. It runs backward and downward just above the external iliac

[1] Presented at the Northwestern Veterinary Medical Association meeting, Vancouver, B. C., July, 1922.

vein, then it turns inward above the obturator vein and passes through the obturator foramen in front of that vessel. This nerve supplies impulse to the external obturator, the pectineus, gracilus, and the short adductors of the leg. If only one obturator nerve is contused the animal may be able to walk, but might need assistance to arise. Then the limb would be held in extreme abduction, but weight could be borne on the affected member. When both obturators are injured the symptoms are entirely different. In the eight cases observed this year none of them were able to get up. I used slings on the first two, but had to admit that in this condition, owing to the extreme nervousness, they are contraindicated, as the majority of patients will fight them. Neither of the two that I used them on were able to stand on their feet, due probably to the moving of one of the feet which caused the legs to slip apart and the animal would fall upon the pubis.

Treatment.—Strychnin in my opinion should be avoided in this condition, as it will tend to cause too much excitement. I have noticed that better results are obtained by using digitalis. Chloral hydrate can also be given if the patient becomes restless. The placenta is retained in most of these cases. Of course it should be removed immediately. Then catheterize. This should be done at least three times a day, as well as to remove from the rectum any accumulated feces there. There seems to be a semiparalysis of the muscles of the rectum and the bladder, as none of the cases observed could defecate or urinate. The animal should also be turned over very often, in fact, after the second day as often as every thirty minutes, as it will tend to decrease the restlessness.

Prognosis.—Unfavorable.

Conclusions.—I have laid more stress on the obturator nerve than on the gluteal because in the latter (according to Williams) the paralysis will disappear in from two or three days to three weeks. When the gluteal is affected the paralysis is generally unilateral, while in obturator paralysis due to the abnormally large fetus in all the cases I have observed the paralysis was bilateral. The obturator nerve can be injured in two places from the fetus—where the nerve passes over the lumbosacral articulation and where it rounds the margin of the obturator foramen.

If the patient should happen to be one of the kind that is

not very nervous when afflicted, then slings might be applied and the hind feet tied together to prevent abduction. But personally I am opposed to the use of slings in this condition. The main issue is stimulation without increasing the nervousness, frequent catheterization and if necessary an anodyne like chloral hydrate or cannabis indica.

AN OUTBREAK OF RABIES

By J. T. QUARLL
Avondale, Pa.

THE OUTBREAK of rabies here reported, in my opinion, is of interest because it shows the necessity for close inquiry as to when animals were actually exposed to infection, as well as the value of the single dose rabies vaccine.

About March 5, 1922, a stray dog, showing clinical symptoms of rabies, passed through Avondale, Pa., and fought with several dogs, one of which was owned by Mr. Howard Brosius. This dog was severely bitten. The stray dog disappeared and all trace of him was lost.

On April 8, the Howard Brosius dog developed rabies, fought with several other dogs in the community and also attacked a cow. The cow was severely bitten on the head.

The cow and all of the dogs that we knew had been exposed to infection from the Howard Brosius dog were given canine rabies vaccine, single dose treatment, from two to four days after this exposure.

Of the total number of animals vaccinated, three dogs developed rabies in from 4 to 6 days after having been vaccinated. The balance of the animals, including the cow, failed to develop rabies.

It is impossible to cause rabies by injecting the particular product used, under the skin of an animal. In view of this fact, and in view of the fact that these animals developed rabies in from 4 to 6 days after having been injected, the vaccine could not have caused the disease, and it, therefore, was freed from blame.

However, I wanted to know more about these cases and upon investigation it was found that the animals that developed rabies, subsequent to vaccination, were animals owned in the

vicinity of the Howard Brosius premises and were animals that had been exposed to the original stray dog that passed through Avondale about March 5. At least 5 weeks had elapsed between date of their first exposure and date of vaccination, and in about 6 weeks, after being exposed to the stray dog, these dogs developed rabies.

I am strongly in favor of using the single dose rabies vaccine as a prophylactic, and look forward to the day when it will be required that all dogs be licensed and immunized against rabies. However, my experiences show that the single dose treatment is not only a prophylactic but will also prevent the development of rabies in animals that have actually been exposed to this disease, if the treatment is given within a reasonable time after exposure.

A single injection is probably all that is necessary for small animals and two treatments (10 c.c.) for horses and cattle. However, I have no hesitancy in using two and three injections on the small animals and two to five or more on the larger animals at one to three day intervals. I have had no bad results.

One of the vaccinated dogs, that has come through without developing rabies, was severely bitten about the head, neck and throat, besides other smaller wounds on the body. One large ugly lacerated wound in the vicinity of the angle of the inferior maxilla, opened into the buccal cavity and was very hard to heal.

The wounds received treatment in about 12 to 18 hours, but the dog was not vaccinated until the third day after exposure. This dog received three single dose treatments. Two full doses (10 c.c.) were given as the first treatment and the other single (5 c.c. each) dose treatments were given at three day intervals, a total of 20 c.c. being given.

The cow referred to in this report is worthy of special mention because three doses of the single dose treatment held this animal, in spite of the fact that she was badly bitten about the head. First treatment was 15 c.c. and second and third treatments 10 c.c. each. The treatments were given at two and three day intervals, a total of 35 c.c. being given.

In very severely bitten cases I have no hesitancy in using two or more doses for dogs and three or more doses for cows and other larger animals for the first treatment.

ANOTHER CASE OF BLACKLEG IN SHEEP

By HADLEIGH MARSH
Montana Livestock Sanitary Board, Helena, Montana

TWO YEARS AGO this laboratory reported the occurrence of blackleg in a bunch of sheep. Our diagnosis was confirmed by Miss Heller of the University of California, who recovered a typical strain of the bacillus of blackleg from material from one of these sheep. Recently another specimen was sent to this laboratory by Dr. C. H. Stevens of Stevensville, Montana, from the muscle of the thigh of a sheep, from which we recovered and isolated in pure culture the bacillus of blackleg.

We do not have a complete history of this case. The sheep was sheared June 12, was sick June 13, and was unable to rise on June 15. The left hind leg was swollen from the hoof to the hip. Three or four other sheep died out of the same bunch, but we do not have complete information as to the extent of the loss.

The muscle specimen was dark red and spongy, having an appearance exactly similar to the characteristic dark, spongy muscle found in cases of blackleg in cattle. A portion of the affected muscle was ground in a mortar with salt solution, and the suspension was injected into the thigh of a guinea-pig. The guinea-pig died in 36 to 40 hours. Postmortem showed swelling of the inoculated leg and the flank, the muscle being hemorrhagic and emphysematous. There was only a small amount of subcutaneous gas. The peritoneum was slightly congested. The internal organs were apparently normal. Smears from the muscle showed a spore-forming bacillus corresponding morphologically to *Bacillus chauveaui*. Smears from the surface of the liver showed a number of rods, some of them in pairs, but no chains or filaments.

Cultures from the heart blood in liver-brain medium developed a pure culture of a large Gram-positive bacillus showing spore formation and many irregularly staining "orgont" forms. The cultures were nonproteolytic, there being no blackening of the brain medium nor of lead acetate test paper. Shake cultures in 1 per cent dextrose-agar developed minute pin-point colonies, with no radiations. A second guinea-pig was inoculated with a liver-brain culture and died in 36 to 40 hours. Smears from the surface of the liver showed numerous bacillary forms, many

in pairs, and a few fours, but no long chains or filaments.

The reactions of this organism in artificial cultures and in the guinea-pig establish the diagnosis of blackleg.

When the specimen was received at the laboratory I expected to find *Vibrion septique* and make a diagnosis of malignant edema due to wound infection after shearing. The finding of blackleg instead of malignant edema in this case lends support to the idea that the blackleg organism is not necessarily specifically connected with outbreaks of blackleg as generally recognized, but that this organism may be the cause of sporadic and occasional cases of blackleg in cattle and sheep and possibly other animals. In other words, when an animal receives a wound of a nature favorable to the development of anaerobic bacteria, it is more or less a matter of chance whether the bacillus of blackleg, *Vibrion septique* or some other anaerobe will be the invader.

NEW VETERINARY HOSPITAL

Early in October ground was broken for the new veterinary hospital of the Kansas State Agricultural College, at Manhattan, Kansas.

The new building will stand directly opposite the old Armory, which was the first building erected on the campus of the college. Thus the oldest and newest structures will face one another.

The hospital building will be constructed at a cost of $100,000.

Dr. B. L. Lake has given up his private practice at Oregon, Ill., to accept the position of County Veterinarian for Whiteside County, Ill., to devote his entire time to tuberculosis eradication. His previous experience of nine years in general practice at Tentopolis, Ill., and of one and a half years as veterinarian and Assistant Manager at the Sinnissippi Farms, should be of great advantage in carrying on the duties of his new position.

Dr. Wm. Moore, State Veterinarian, and Dr. C. C. Watts, Assistant State Veterinarian, of North Carolina, have completed a law course and were granted a license to practice law by the Supreme Court of North Carolina, on an examination held August 21, 1922.

ABSTRACTS

THE DURATION OF THE INFECTIOUS PERIOD IN APHTHOUS FEVER (FOOT-AND-MOUTH DISEASE). Charles Lebailly. Comp. Rend. Acad. Sci., vol. 174 (1922), no. 24, p. 1580.

Classical treatises and current opinion are in accord as to aphthous fever being infectious for several weeks. The sanitary police regulations impose a quarantine of at least 15 days following the cure (disposal) of the last case of aphthous fever in an outbreak. Then, it is important for the struggle against the epizootic, to determine exactly, if possible, the extent of the period during which animals attacked are capable of transmitting the disease. This idea presents a leading interest for experiment.

The experiments, the results of which I report, were made in the stable, principally on bovines of Normandy breeding, young or old, excluding females in the period of lactation, on which, for material reasons, it has not yet been possible for me to experiment. The virus that I used came from an outbreak in the vicinity of Caen, where it was procured in the course of an epizootic in December, 1920. I kept it alive by passing through susceptible animals. The form of disease thus induced appeared from the third to the seventh day.

If, at the first indication of a rise in temperature till the rupture of vesicles took place, I brought a susceptible bovine in contact with the sick one, the former infallibly contracted the disease. Its temperature increased at the end of 48 to 72 hours—it was a classic infection.

If, on the other hand, I allowed 4 days to pass after the appearance of the first vesicle, which in general follows closely after the initial sign of fever and manifests itself exteriorly by the appearance of slobbers, and then brought into the stable a susceptible animal, it did not become infected. There was complete contact between the two animals, both were hitched to the same ring for 6 hours, they ate from the same rack and manger, they drank from the same receptacle, and shared the same litter, and after the 6 hours of contact the susceptible animal occupied the place of the sick one. No disinfectants of any sort were used. My stables are like those on farms where

the disease has a free course, the animals subjected to the infection had all facilities for picking the germs (virus) of aphthous fever from the walls, the beams, and the remains of litter from the preceding days.

During this period of contact the sick animal presented a lamentable aspect; the ulcerated (inflamed?) vesicles were partly covered with a grayish deposit, shreds of epidermis (mucous membrane) were still being detached, a mossy froth came from the mouth, and there was heard at intervals the characteristic sucking sound.

It is the current opinion that at this stage this animal is highly infectious, that it must be disinfected as well as the objects it has soiled. However, for 8 months in the localities where I experimented I suppressed completely the use of disinfectants; my new animals were brought into the stables with the sick ones on the fourth day following the appearance of vesicles. I have never under these conditions observed a case of infection. It goes without saying that my new animals were quite susceptible, a fact proven 15 days or a month later by the inoculation of the virus or by direct contact during the virulent period of the disease, when they were always infected.

Thus it appears that in the evolution of aphthous fever we must distinguish two periods. The first period obscure, impossible to diagnose through observation, is fully more dangerous since it can not be recognized except by thermic rise of temperature. As soon as there is noted a thermic rise, if only of a few tenths degree, the animal disseminates the infection wherever it goes and transmits the disease, unsuspected, to others which spread it in the same way.

On the other hand, the second period, which attracts the attention of even unqualified observers, does not, in the least, merit the terror which it inspires. The disease at that stage is most painful to the animals, but when they have slobbered for four days they are incapable of transmitting aphthous fever.

The conclusion reached through my experiments is that the disease is propagated in the animals only during the period of invasion and incubation, which time is very short. These observations explain the weakness of sanitary measures applied when epizootics have reached a certain development. The most radical measures, such as slaughter, attain nothing more than supervision and sequestration of primary centers.

In a period of epizootic the animals that have slobbered for four days are less suspicious than those of healthy appearance, as they are then inoffensive since the virus of aphtous fever has died within them. The healthy appearing animals are the ones that should be quarantined before being introduced into an indemnified herd. T. P. W.

THE VETERINARIAN AND THE LIVESTOCK SERVICES IN THE UNITED STATES. C. Lopez y Lopez. Revista de Higiene y Sanidad Pecuarias, Madrid, vol. XII (1922), no. 5, pp. 220-250.

In this article, the nature of which is indicated by the subtitle "Impressions of a Traveler," the author describes his visits to the laboratories of H. K. Mulford Co., Lederle Antitoxin Laboratories, the Veterinary School of the University of Pennsylvania and the U. S. Bureau of Animal Industry and discusses in a general way the differences between conditions here and conditions in Spain.

Full information is given regarding courses of instruction, etc., at the University of Pennsylvania Veterinary School and there is also a general discussion of veterinary education in the United States.

The organization and work of the U. S. Bureau of Animal Industry are taken up in some little detail, with a brief description of the work of each division. The Bureau is, in the author's opinion, the greatest organization of its kind in the world, and worthy of imitation by other countries.

THE LICKING HABIT IN CATTLE AND ITS CAUSES. N. Zuntz. Abst. in Biedermann's Zentralblatt, vol. 1 (1921), part 1, pp. 33-34.

The analogy between the symptoms of licking disease and those induced by depriving young growing animals of certain constituents of protein, such as tyrosin, is, according to the author, so striking, that we are compelled to suppose that the habit of excessive licking in cattle is due to the absence of one or more of the substances necessary for the development of the body. Further, the grazing experiments made by the author, the success of applying a dressing of sodium nitrate to the pastures, and the fact that the second cutting suited the ani-

mals better than the first cutting of hay, all suggested that the trouble was due to a deficiency of protein.

The richer the forage in protein, the easier becomes the elimination of the constitutents which are not used in metabolism. Further, in many cases, the real remedy for the licking disease may consist, on the one hand, of increasing the absolute amount of protein, and on the other of giving protein of a different composition by altering the constituents of the forage, or the fertilizer, or using forage of a different quality. The drying of the forage may also have some effect, seeing that under natural conditions certain components are washed out by the rain, and that the action of the sun produces chemical changes affecting some important substances present in fresh grass.

The author, after a consideration of all the data referring to the licking disease, and the conclusions that may be drawn from them, recommends the following prophylactic measures:

(1) Care should be taken that sodium should not be lacking in the forage. The rest of the mineral constituents should form a basic mixture containing 600 to 750 mgm. of alkali equivalents.

(2) The protein content of the ration ought to be increased by the addition of concentrates rich in protein (linseed cake) suitable for ruminants.

(3) Hay must be made of the youngest grass possible; this has recently been advised by Neubauer as the best means of remedying the lack of protein in forage intended for growing stock.

(4) In conclusion, the author lays great stress on the necessity of further experiment to determine whether the good effect of sodium nitrate observed by him is to be attributed to the sodium, or the nitrogen.—(*From Internat. Rev. of Sci. and Prac. of Agric., Nov.*, 1921, *p.* 1436.)

THE KEEPING QUALITIES OF DILUTED TUBERCULIN. A. Eloire. Rec. Méd. Vét., vol. 93, no. 7, April 15, 1922, p. 200.

Ordinary tuberculin intended for subcutaneous injection, kept for seven years (1914 to 1921), was found to have retained apparently unimpaired its diagnostic properties when used for the intradermic and palpebral tests. The tuberculin was contained in small bottles with rubber stoppers tied with cord, and the bottles were wrapped in colored paper, so that the product was protected from air and light. It contained phenolized water as a diluent.

A COMPARATIVE STUDY OF BOVINE ABORTION AND MALTA FEVER, FROM THE BACTERIOLOGICAL POINT OF VIEW. Z. Khaled. Jour. Hygiene, vol. 20 (1921), no. 4, pp. 319-329. Abst. in Trop. Vet. Bull., Aug. 31, 1922, p. 78.

In the investigations detailed in this paper 13 strains of *B. melitensis,* 10 of *B. abortus,* and 3 of *B. paramelitensis* have been examined. They are said to be representative of strains isolated in America, on the Continent, and in this country.

The author supports the view put forward by Meyer and Feusier that a special genus—"*Brucella*"—should be made for these three organisms.

A brief account of the morphology and cultural characters of the organisms is given.

In a section devoted to methods of infection the author states, in connection with *B. abortus,* that after abortion takes place "The animal recovers and then either remains sterile or aborts soon after service, generally after two months. * * * The males apparently act as carriers. The causal organism can be isolated from the spleen, liver, testes, seminal vesicles and uterine discharges, as well as from the milk; the fetal membranes, stomach, amniotic fluid and cotyledons as a rule give pure cultures. Isolation and disinfection are very effective measures."

Although 26 strains of the three organisms are mentioned in the early part of the paper, the author later states that 30 were used.

In the agglutination tests, details of the results with only 9 of these are given. Of these, 3 were *B. melitensis,* 2 *B. paramelitensis,* and 4 *B. abortus.*

Antisera, prepared from rabbits, were used against all of these. A serum was considered satisfactory only when it caused agglutination with the homologous organism in a dilution of 1 in 6,400.

Anti-*melitensis* serum agglutinated *B. melitensis* and *B. abortus* to about the same extent, and was practically inactive with *B. paramelitensis.*

Anti-*abortus* serum agglutinated all the nine strains to about the same extent, while anti-*paramelitensis* serum was active almost exclusively with its homologous organism, no agglutination taking place with any of the other strains in dilutions above 1 in 200.

In the absorption tests the results obtained with only five or six of the strains used are given, and only *B. melitensis* and *B. abortus* were used.

B. melitensis removed from anti-*melitensis* serum all agglutinins for *B. melitensis* and *B. abortus.*

B. abortus removed from anti-*melitensis* serum all agglutinins for the same organisms.

B. abortus removed from anti-*abortus* serum all agglutinins for *B. abortus* and *B. melitensis.*

B. melitensis removed from anti-*abortus* serum all agglutinins for *B. melitensis,* but not those of *B. abortus;* this organism was still agglutinated in dilutions of 1 in 800 after the absorption.

In a single experiment, inoculation of a monkey with *B. abortus* was found to confer some degree of immunity against a subsequent inoculation with *B. melitensis;* the control monkey showed a febrile reaction to the test inoculation, which lasted a month, and continued to lose weight.

In regard to the pathogenicity for man, the author states that he has seen cases in Egypt which were typical undulant fever, confirmed by laboratory diagnosis, in persons who have never ingested goat's milk. He suggests that *B. abortus* bears to *B. melitensis* a relationship similar to that of cowpox to smallpox.

THE RELATIONSHIP BETWEEN B. MELITENSIS AND B. ABORTUS, BANG. J. Skaric. Zeitschr. f. Hygiene u. Infektionskrankh., vol. 95 (1922), no. 3, pp. 358-364. Abst. in Trop. Vet. Bull., Aug. 31, 1922, p. 79.

The author has carried out a number of tests with different strains of abortion bacilli and Malta fever organisms and with immune sera prepared by means of these. The results are parallel with those obtained by other investigators.

He suggests that agglutination shown by the serum of patients with Malta fever bacili may possibly be due to agglutinins elaborated as a result of the ingestion of milk containing abortion bacilli.

THE TREATMENT OF MALTA FEVER AND CONTAGIOUS ABORTION OF CATTLE WITH COLLARGOL AND SIMILAR PREPARATIONS. H. Ziemann. Deut. Med. Wochenschr., vol. 47 (1921), no. 18, p. 500. Abst. in Trop. Vet. Bull., Aug. 31, 1922, p. 79.

The author states in this brief note, that he has been able to effect a cure in cases of Malta fever by intravenous injections of a two per cent solution of collargol. The dose was from 2 to 4 cc.

In one case a single injection sufficed, but in others a second injection was given. In the absence of further cases upon which to try the method he has turned his attention to contagious abortion because of the similarity of the causal organisms. It is not clear that he has actually carried out any experiments in this connection. No results are given.

KEEPING MILK BY THE ADDITION OF POTASSIUM DICHROMATE WITHOUT INJURING TUBERCLE BACILLI PRESENT IN THE SAMPLE. Krautstrunk and Forst. Zietschr f. Fleischu. Milchhygiene, vol. 32 (1922), no. 10, p. 121.

The addition of 1 to 100 potassium dichromate to milk does not destroy the virulence of tubercle bacilli after 12 days contact. Fifty per cent of the guinea-pigs injected with this material die with symptoms of poisoning after a few days. Guinea-pigs inoculated with milk containing tubercle bacilli preserved for 5 and 7 days with potassium dichromate in the proportion of 1 to 500 developed extensive tuberculosis. An addition of potassium dichromate in the proportion of 1 to 500 prevented the coagulation of milk at room temperature for a period of about 3 weeks. The development of bacteria in milk was prevented to a notable degree by the addition of potassium dichromate in the proportion of 1 to 500. Milk samples intended for examination for tubercle bacilli are best preserved with potassium dichromate in the proportion of 1 to 500.

"Hum," murmured the doctor absently, as he cut into his restaurant steak. "Hum, patient very sentile, with extreme hardening of the tissues."—*New York Sun.*

REVIEWS

POULTRY DISEASES. B. F. Kaupp, B. S., M. S., D. V. M., Pathologist and Poultry Investigator, Animal Industry Division, North Carolina Agricultural College. Published by Alexander Eger, Chicago, Ill., 1922. Price $2.75.

The publication of the third edition of "Poultry Diseases," by Professor B. F. Kaupp, has just been announced. This edition contains 342 pages and 134 illustrations, and is divided into twenty chapters, as follows: Anatomy, Sanitation, External Parasites, Internal Parasites, Diseases of the Digestive Tract of Fowls, Diseases Due to Bacteria, Constitutional Diseases, Diseases of the Respiratory Passages, Diseases of the Liver, Diseases of the Ovary and the Oviduct, General Diseases, Tumors, Diseases of the Brain and Nerves of the Fowl, Bacteria of the Intestinal Tract of the Fowl, Composition of the Egg, Malformation, Fractures-Wounds-Anaesthesia, Castration or Caponizing, Foods Poisonous to Fowls, and Poultry Remedies.

The range of Dr. Kaupp's work is apparent from the chapter titles and that it is popular among poultrymen and veterinarians is evident from the fact that already the third edition has appeared upon the market. The new edition appears in attractive form; the illustrations are clear, the paper and binding are of good quality, and, most important of all, it shows great care in the selection, preparation and arrangement of the subject matter. The diseases and care of poultry are subjects that are steadily increasing in importance. Dr. Kaupp's work on poultry diseases is found in the library of many of our veterinary practitioners and the new up-to-date edition no doubt will get a welcome reception. U. G. H.

DIAGNOSIS AND TREATMENT OF TUBERCULOSIS. A. Wolff-Eisner. Leipzig, 1921; p. 188; published by Tauchniz. With 16 plates and 15 figures. (Translated from Bulletin de l'Institut Pasteur, vol. 20, p. 567.)

This first part of the work, which is to comprise three parts in all, is devoted to the specific diagnosis of tuberculosis, especially to the tuberculin reactions.

The first of five chapters concerns the technic and different methods of application of tuberculin (cuti-reaction, ophthalmo-reaction, etc.) (pp. 1-41).

The value of the tuberculin reaction in different affections (internal pathology, dermatology, gynecology, pediatry, ophthalmology, laryngology, etc.) is the subject of the second chapter (pp. 42-128).

The third chapter (pp. 129-193) gives a brief résumé of the processes susceptible of facilitating diagnosis and which the author terms auxiliaries, such as agglutination after Courmont-Arloing, the fixation reaction, activation by means of cobra venom after Calmette, the opsonins and dialysis after Abderhalden.

An entire chapter (pp. 144-163) is given to a treatise on subcutaneous injections of tuberculin: technic, indications and counterindications, diagnostic value and complications.

Finally, the fifth and last chapter (pp. 164-182) examines the question of diagnosis from the social, economic and political points of view; the part to be taken by the army, insurance companies and rural economy (bovine tuberculosis).

The fame of the author makes it unnecessary for us to emphasize the rigorous scientific care which characterizes the work. What gives it a special value is that the author is not only a laboratory man of recognized competency, but is also a well-informed physician, never having lost contact with the clinic.

WISCONSIN HAS ONE-FOURTH OF COW-TESTING ASSOCIATIONS

The 115 cow-testing associations in Wisconsin equal almost one-fourth of all the associations of the country. Twelve of these associations have been organized since December 1, 1921, and the membership in the State now numbers about 3,300 farmers owning 55,000 cows.

The aims of the associations have been to weed out unprofitable cows and to feed the animals balanced rations for maximum milk production. Records of the associations show the value of high-grade cows and purebred sires. Last year 335 purebred bulls were purchased by the associations and 83 scrub bulls replaced by purebreds in 59 associations.

ARMY VETERINARY SERVICE

A BRITISH ARMY VETERINARIAN ON AMERICAN HORSES

SOME interesting observations on his experiences in the purchase of horses and mules in the United States for the British Army during the war are contained in a paper presented by Dr. C. W. Cartwright before the North Wales Veterinary Association and published in *The Veterinary Record.*

"The purchasing points," he says, "were situated chiefly in the big cities of the horse-raising districts of the Middle West, of Illinois, Missouri, Iowa, Kansas, Minnesota, and even as far west as Ogden, in Utah, while mules were obtained principally from St. Louis, the Southern States, and as far south as San Antonio, in South Texas."

The procedure of examining animals before purchase was as follows: "Paces shown, mouth and eyes examined, forelegs handled, trotted, backed, turned, etc., and, if satisfactory, passed down to have temperature taken and be ridden for wind. Seldom could the hind legs be handled without special precautions; to do so was to court disaster. In the wind test the horse was ridden by expert cowboys, who, by the way, well earned their high pay. I never saw one unseated unless the horse fell."

Artillery and heavy horses of the Percheron class, he says, were good and plentiful. "Belgians, Clydesdales and Suffolks were also met with, while Shires (generally of very indifferent quality) were seldom seen. Shires are not popular in America. Riding horses were indifferent, lacking in that great essential, 'good shoulders.' Cow ponies of mustang type were hardy and capable of good service, while the Standardbred saddle horse of Kentucky, so prized in America, was tried but found lacking in stamina. Pacing horses were not purchased."

The rejections for veterinary reasons were many, and included age, respiratory diseases, defective vision of all kinds, periodic ophthalmia in all its stages, even to total blindness; usual diseases of bone and cartilage and wire cuts of all kinds. Laminitis and dropped soles were very common in horses, but, curiously, he did not meet with any in the mule. Shivering and stringhalt were, however, common in mules. Of all the diseases encount-

ered in animals after purchase, catarrhal or shipping fever with its resultant complications formed the greatest percentage of cases. The mallein test was applied as daily routine.

"Towards the end of the day," continues Dr. Cartwright, "when the contractor's horses had all been shown, smaller fry in the dealing world would, by arrangement, be allowed to present animals for inspection. As a rule they belonged to the Jewish fraternity, could 'guess' more than the truth, and were past masters in the art of faking. To mention a few conditions —bishoping, vicious horses doped for the day, inflation of atrophied or sweenied shoulders, also hocks to mask a small spavin, curbs singed and flattened, sand-cracks neatly filled, cocain occasionally used, roarers with nostrils plugged high up with one or more small rubber balls or lemons tied to a string —if opportunity presented they would be removed."

In conclusion Dr. Cartwright says of American horses and mules, "I am sure we are agreed that, though our debt to the British war horse and mule is great, our debt to them is greater."

A DEFINITION OF BOVINE VIRUS

In his series of favorite stories Irvin Cobb relates the following:

In a rural district in Indiana is a general practitioner of medicine, who covers up a wide and comprehensive range of ignorance under an impressive front. Among the natives he passes for a veritable fount of wisdom.

One evening he walked into the country store, and the storekeeper, addressing the congregated loafers about the store, said:

"Now we can find out about it." He turned to the newcomer.

"Say, Doc," he said, "there's a question come up that we want you to settle. I been readin' in the paper here about this here new bovine virus that them foreign doctors is usin' now. Just what is bovine virus, anyhow?"

The oracle scarcely hesitated.

"Bovine virus," he said, in his most oratorical manner, "derives its name from the man that discovered it—the eminent French scientist, Dr. George W. Bovine."

"There, now," said the storekeeper, facing the audience, "I told you the Doc would know if anybody did."

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the October* JOURNAL.)

TUESDAY AFTERNOON, AUGUST 29, 1922

The second general session convened at 1:35 p. m., President Kinsley presiding.

REPORT OF COMMITTEE ON HISTORY

PRESIDENT KINSLEY: The first thing that we will have will be the report of the Committee on History. Dr. Mayo, the Secretary, has the report of Dr. Adams and will read it.

(Secretary Mayo read the report, as follows:)

Since the Denver meeting the chairman of this committee has continued to gather facts relative to the history of our profession in these United States, and respectfully submits the following as accomplished and indicative of the status of your committee's work:

1. Veterinary schools. The important facts relating to the origin, growth and influence of the several private, State or Provincial schools from which veterinarians have been graduated have been ascertained thus far solely from printed catalogs and other official publications. These data must be considerably augmented and given a personal touch through correspondence with present or past officers of these schools. Your committee has felt that this part of its work was less urgent and could safely be considered last, because such histories are largely matters of record.

2. Biographic sketches of the makers of veterinary history—those pioneers in American comparative medicine who constituted all there was of our profession between thirty and fifty years ago—should give the chief interest and value to the history. Much material is on hand, but much more is needed. May we not count upon your hearty cooperation when we ask you for such information?

3. State veterinary associations and the legal enactments of the several States by which the profession has been given recognition, protection and assistance have been a matter of investigation and record. It is expected that during the coming year this will be completed, sifted and properly embodied in our report, at least so far as the older States are concerned.

4. History of the United States Bureau of Animal Industry. During the past year Dr. U. G. Houck, a former member of this committee, and for some years past an official of the B. A. I., has continued the preparation of an accurate and fairly complete historical sketch of the B. A. I. With the consent of the Chief of the Bureau, Dr. Houck has collaborated with the chiefs of the several divisions, and announces, August 14, 1922, that the sketch is about completed. It will consist of at least 560 pages of manuscript and will make about 225 pages of printed matter.

5. History of the A. V. M. A. This will be given very briefly, because it is now largely a matter of printed record, in its minutes and proceedings.

In conclusion, your committee believes the completed history of the veterinary profession in the United States and Canada will be ready to submit to the A. V. M. A. at its next annual convention and craves your patience till then. JOHN W. ADAMS, *Chairman.*

On motion of Dr. O. Faust of Poughkeepsie, N. Y., it was voted that the report be received and the committee continued.

REPORT OF EXECUTIVE BOARD

PRESIDENT KINSLEY: The Secretary has a partial report from the Executive Board, particularly referring to the election of new members.

SECRETARY MAYO: The following applications for membership have been favorably recommended by the Executive Board:

Mosley, Thomas, Duncan, Okla.
Farquharson, James, Fort Collins, Colo.
Olson, Edgar L., Prescott, Ariz.
McKitterick, James A., Greenwood, Mo.
Shake, Frank Curtis, Hutsonville, Ill.
Wallace, William A., Ashland, Ky.
Strader, H. N., New Hampton, Iowa.
Williams, Edgar A., Aurora, Nebr.
Gartell, J. V., Lincoln, Nebr.
Wesner, Marnie E., Ohio, Ill.
Rose, G. A., Toronto, Canada.
Head, William M., Bradford, Ill.
Cook, O. A., Arrowsmith, Ill.
Davis, D. E., Manhattan, Kans.
Sartorius, George Raymond, Athens, Ill.
Randall, Raymond, Washington, D. C.
Grove, E. E., Newell, Iowa.
Pease, James F., St. Louis, Mo.
Lipe, V. R., Raymond, Ill.
Villeneuve, J. H., Montreal, Quebec.
Rhodes, Howard C., St. Albans, Vt.
Thompson, Henry R., Kansas City, Mo.
Long, R. S., Upham, N. D.
Thompson, William A., Elmvale, Ontario.
Beckmay, C. H., Humboldt, Iowa.
Henderson, C. J., Newman Grove, Nebr.
Gilliatt, Floyd, Decker, Ind.
Leider, L. S., Howard, S. D.
Barber, John W., Exeter, Nebr.
Tobias, David D., Lincoln, Nebr.
Leffler, David, Bronx, N. Y.
Fletcher, Arthur Taylor, Virden, Ill.

It is recommended that those names I have read be elected to membership.

(On motion of Dr. Hoskins, the recommendation of the Executive Board was approved.)

SECRETARY MAYO: The Executive Board recommend that the By-Laws be suspended and the following be elected to membership:

Shikles, J. R., Dearborn, Mo.
Winegardner, C. C., Goshen, Ind.
Cunard, T. J., Ninety-Six, S. C.

None of the schools from which these persons were graduated were recognized by the Association. Graduates of the Western Veterinary College who have made good in practice after they have been out a number of years have been accepted under suspension of the By-Laws. The University of South Carolina granted a degree in veterinary medicine to Dr. Cunard. He was the only man who ever received the degree of veterinary medicine from that institution. He is vice-president of the State Association, president of the Southern Cattle Growers' Association, and an outstanding man in that country, and he is recommended by Dr. Nyles who was professor of Veterinary Science of that school at that time when he took his degree in veterinary medicine.

(On motion of Dr. Hoskins, the report of the Executive Board was adopted.)

SECRETARY MAYO: I have a resignation of Dr. Lawson of Ontario. The Executive Board recommend that it be accepted.

(On motion of Dr. Hoskins, the recommendation was adopted.)

SECRETARY MAYO: I have some more reports from the Executive Board. These recommendations were made to the Association last year; they were laid on the table, and they come up now for adoption.

It is recommended by the Executive Board that the Constitution and By-Laws be amended as follows: Section 7, Article G, by adding "Excepting members residing in countries other than the United States and Canada, the said ballot shall be returned within ninety days from the date of issue."

You remember I called attention last year to the fact that on a postcard vote the By-Laws provide that the ballot must be returned in thirty days. It is impossible to get a ballot to the Philippines and back under sixty days, and so it was proposed to change the By-Laws making it ninety days for members living in foreign countries to get their votes back to the Secretary.

(On motion of Dr. Hoskins, the recommendation was adopted.)

SECRETARY MAYO: The Executive Board also recommend that Article XI of the By-Laws be changed adding, "Excepting the Editor, Secretary, Business Manager and Treasurer, who shall assume their duties within thirty days following their election." At the present time the Constitution and By-Laws provide: "The officers of the Association shall assume their duties at the close of the annual meeting at which they are elected."

There is so much to be done at the time of the annual meeting, so far as the Secretary's office is concerned, that it is necessary to allow a little time to get the books straightened up before turning them over. That practice has been followed in the past as a matter of custom; we had to do it. This is a change in the Constitution and By-Laws to conform.

(On motion of Dr. Torrance, the recommendation was adopted.)

SECRETARY MAYO: The Executive Board also recommend to change Article V, Section 5, to read that the treasurer shall give an acceptable bond to the Executive Board. At the present time it reads he shall give bond in the sum of $5,000. That was provided when the Association didn't have much in the treasury. This recommendation was proposed by the Treasurer, Dr. Jacob. Now that the Association has $30,000 in the treasury, it is felt that the Executive Board should decide how much of a bond shall be furnished.

(On motion of Dr. Faust, the recommendation was adopted.)

SECRETARY MAYO: The Executive Board recommends that Paragraph L, Section 7, of the Constitution be amended by eliminating the word "yearly." I will read that paragraph.

"It shall be the duty of the Executive Board to consider and recommend yearly to the Association concerning the selection of Secretary and Editor and Business Manager of the JOURNAL of the American Veterinary Medical Association," etc.

The Board in recommending this, and looking toward the employment of someone who shall occupy the combined office of Editor and Secretary, find that they want to make this office rather stable and permanent, provided the services are satisfactory, and they think it would be better to eliminate the word "yearly."

(On motion of Dr. Torrance, the recommendation was adopted.)

REPORT OF SALMON MEMORIAL COMMITTEE

PRESIDENT KINSLEY: We will take up one short committee report, that of the Salmon Memorial Committee, by Dr. Hoskins.

(Dr. Hoskins read the following report:)

The Salmon Memorial Committee has made no effort during the past year to collect additional subscriptions to the fund. It is the judgment of a majority of the committee that it is inadvisable to extend further the efforts to increase this fund, started in 1915. President Kinsley has recommended that the fund be made immediately available for the financial assistance of worthy students endeavoring to obtain a veterinary education.

The amount collected, with interest to date, represented by cash in bank and Liberty Bonds, closely approximates $5,000. This amount invested at 5 per cent will yield $250 per year, and leave the capital fund intact. Your committee, therefore, recommends that the suggestion contained in President Kinsley's annual address be adopted and the matter placed in the hands of the incoming officers, with a view to making the income from the fund available during the coming college year.

SALMON MEMORIAL FUND COMMITTEE.
S. BRENTON, *Chairman.*
J. R. MOHLER.
H. PRESTON HOSKINS, *Secretary-Treasurer.*

On motion of Dr. J. F. DeVine of Goshen, N. Y., the report was adopted.

PRESIDENT KINSLEY: We have adopted a report and recommendations that the income from the Salmon Memorial Fund, which will amount to approximately $250 a year, be used for some needy student. Provision should be made for the application of this fund. I don't know who is to have charge of it.

DR. HOSKINS: It was the sense of the committee that the committee be discharged and that the incoming officers make whatever rules and regulations would be necessary to administer this fund. It was also the sense of the committee that recommendations for gifts from this fund come through the dean of the veterinary college which the student was attending. It was also the sense of the committee that the entire sum of $250 be not given to any one or any two students, but that greater good would probably come if the amount were divided so that it would help three or four or may be five. It very often happens that a veterinary student gets along toward the end of his course and $50 or $75 stands between him and the successful completion of that course. Doubtless there are men in the audience who have known of such cases. In keeping with the spirit contained in Dr. Kinsley's address, we believe the income from this fund at this time could be used in no better way than along that particular line.

SECRETARY MAYO: I move that the matter of the distribution of the Salmon Memorial Fund be referred to the Executive Board.

(The motion was seconded by Dr. Faust.)

SECRETARY MAYO: I think it is better to be referred to the Executive Board rather than to the officers for any one year. This fund and its administration is a more or less continuous and permanent proposition. Some of the officers at least will be changed from year to year, and the Executive Board, or somebody that takes the place of that Board in the reorganization, in my judgment, would be better able to look after that fund continuously than those who are just simply in for a year or so.

(The motion was carried.)

GREETINGS FROM DR. WRAY

SECRETARY MAYO: I received this morning a cable from Beaconsfield, England: "Present to the Association my best wishes for their good health and prosperity of the individuals and the profession generally. W. H. Wray." (Applause.)

ELECTION OF OFFICERS

PRESIDENT KINSLEY: The next order will be the election of officers. I wish to call your attention to some paragraphs in our Constitution and By-Laws. First, "No member shall vote at a regular meeting until he has registered and paid his entire indebtedness to this Association." Second, "Nominations for office, except as otherwise provided for by postcard ballot,

shall be made orally. A nominating speech shall not exceed two minutes, and the nominations shall not be closed until every member has had opportunity to present his candidate." Third, "The election is by a majority of all votes cast."

I just wanted you to understand the regulations under which we are operating. We are ready for nominations for President for the ensuing year.

DR. T. H. FERGUSON: I would like to place before this Association the name of Dr. W. H. Welch, of Lexington, Illinois, for President. (Applause.)

DR. TORRANCE: It gives me great pleasure, as a Canadian representative, to second the nomination. It is a great thing in the history of the Association to have a practitioner occupying the presidential chair. (Applause.)

DR. KIERNAN: The immortal Lincoln once said that a house divided against itself can not stand. This Association composed of virile, free men, naturally at times has divergence in views, but it shows the character of the personnel of this organization when they all can get together and unite on the officers of the Association. I take great pleasure in seconding the nomination of Dr. Welch. (Applause.)

DR. V. A. MOORE: It gives me great pleasure, also, to second the nomination of Dr. Welch. (Applause.)

DR. COTTON: I consider it an honor and privilege to second the nomination of Dr. Welch. (Applause.)

DR. T. E. MUNCE: What I have seen and heard at this meeting indicates to me that Dr. W. H. Welch, of Illinois, is to the veterinary profession, and particularly to the practitioners of the profession in this locality, what the unknown soldier was to France, England and to the United States. In view of the service rendered and the sacrifices made by this distinguished practitioner, I move that the nominations close and that the election of Dr. Welch be made by acclamation. (Applause.)

(The motion was seconded.)

PRESIDENT KINSLEY: The motion is out of order, but if there is no objection, it will be put.

(The motion was unanimously carried.)

DR. W. H. WELCH: Mr. President and fellow-members of the American Veterinary Medical Association: I thank you very sincerely for the distinguished honor that you have conferred upon me, and for the great confidence that you have expressed in me by electing me as your President for the ensuing year. I can only say I hope that as my election was made unanimous, all the events of the coming year may be as harmonious. I thank you. (Applause.)

PRESIDENT KINSLEY: Next in order is the election of Vice-Presidents. There are five Vice-Presidents to be elected. The usual procedure is that the five Vice-Presidents receiving the highest number of votes be duly elected, the one receiving the

largest number being first Vice-President, the one next in number Second, and so on. We are now ready for nominations for Vice-Presidents.

(The following nominations were made:)

Colonel McKinnon, of the Veterinary Corps, U. S. Army.
Dr. J. G. Eagle, Oklahoma City, Okla.
Dr. T. H. Ferguson, Lake Geneva, Wis.
Dr. J. H. McNeil, Trenton, N. J.
Dr. M. C. Baker, Montreal, Canada.
Dr. George H. Hart, Berkeley, Calif.
Dr. I. E. Newsom, Fort Collins, Colo.
Dr. E. P. Flower, Baton Rouge, La.
Dr. J. T. Jennemann, St. Louis, Mo.

SECRETARY MAYO: I asked Dr. Udall to nominate Col. McKinnon. Col. McKinnon has been selected to head the Veterinary Corps. There is nothing to this but a little honor, but some of us feel that it would be a decided help to him in his work in the Army Veterinary Service if you felt disposed to make him one of your Vice-Presidents.

PRESIDENT KINSLEY: The Chair will appoint Dr. Hoskins, Dr. Watson and Dr. Fitch as tellers.

We have yet to elect the Member-at-Large on the Executive Board, and I believe we can ask for nominations at this time.

DR. W. T. SPENCER: I want to place in nomination for this important position a veterinarian who can fill the position well. He has had experience as a practitioner and has served his country overseas. I nominate Dr. R. C. Julien, State Veterinarian of Indiana. (Applause.)

DR. MERILLAT: As a member of the Reorganization Committee of this Association, after a year's study of the proposed new Constitution, it appears to me that this is not a very good time to make any changes in the Executive Board, and for that reason I want to put in nomination the present incumbent of the office, Dr. Cassius Way, of New York. (Applause.)

DR. WHITE: I desire, for the reasons given and others which it is too hot to mention, to second the nomination of Dr. Way. (Applause.)

PRESIDENT KINSLEY: I appoint Dr. Cloud of Texas, Dr. Udall and Capt. Kelser as tellers.

While you are preparing those ballots, we have a very important officer, the Treasurer, yet to be elected. Whom will you nominate for your Treasurer?

DR. D. H. UDALL: I place in nomination the name of Dr. Jacob. (Applause.)

DR. STANFORD: I move he be elected by acclamation.

(The motion was seconded.)

PRESIDENT KINSLEY: Are there any further nominations? If not, I will accept the motion that Dr. Jacob be elected by acclamation.

(The motion was carried.)

DR. JACOB: I wish it were possible for me to entertain you with a speech while you are awaiting the results of the general election. However, I am not capable of doing that, and I simply take this opportunity of expressing to you my sincere appreciation. I hope that I will be able to serve you for the coming year in an efficient manner. I can assure you that I will try my best. (Applause.)

PLACE OF NEXT MEETING

PRESIDENT KINSLEY: Yesterday it was agreed that at this time we would consider the proposition of the meeting place for 1923. I wish to read again from the Constitution: "The time, place and duration of the regular meetings shall be fixed by the Executive Board within sixty days after the annual meeting, unless otherwise ordered by the Association at an annual meeting."

Dr. Mayo has some written invitations.

SECRETARY MAYO: These are invitations that have come to the Secretary's office. Official invitations from Omaha, Bureau of Publicity, Chamber of Commerce, Live Stock Exchange; Montreal, a telegram from Dr. Baker; a letter from the Secretay of the Missouri Valley Association to the effect that the Missouri Valley Association has extended an invitation to come to Omaha; Convention Bureau, West Side Association, New York City; San Francisco Convention and Tourist League; Detroit Convention and Tourist Bureau; Grand Hotel, Mackinac Island, Michigan; Chicago Association of Commerce; Convention Bureau, Chamber of Commerce, Des Moines; Merchants' Association of New York City; Hotel Traymore, Atlantic City, N. J.; Cincinnati, Chamber of Commerce and Merchants' Exchange. There are letters in connection with each of them.

DR. TORRANCE: I desire, on behalf of the Canadian profession, to present a most cordial invitation for this Association to hold the 1923 meeting in Canada. Only twice in the history of the Association has Canada been favored by a visit from it. The last occasion was eleven years ago. We believe it is time for you to come to see us again. I not only have an invitation from the profession of the Dominion of Canada, but the presidents of the associations of the Provinces of Ontario and Quebec are here to present in person the invitations of those two organizations.

We have an invitation officially from the city of Montreal, from the Montreal Board of Commerce, the Board of Trade, from the University of McGill, from Montreal University, from the Veterinary Faculty of that University. I can assure you that in Montreal you will find not only a warm welcome from the people, from the representatives of this profession, but you will find in that city a place of meeting where the noise will be

created only by yourselves and you won't be annoyed by street cars and other extraneous noises. If you want to make merry, you will find in that city everything that is desirable.

I feel that in presenting the claims of Montreal and of Canada to this organization it needs but a very short speech. I know that since the Eighteenth Amendment went into force in the United States there are only three classes of people who are satisfied with the conditions—those who never had a drink and never wanted one, those who still have a little, and those who have a little still. (Laughter.) Now in Montreal you don't need to provide your own; it will be provided for you. Come to Montreal and receive the welcome of the Canadian profession. (Applause.)

DR. M. C. BAKER: It is with a great deal of pleasure that I represent here today the veterinary surgeons of the Province of Quebec, having been asked by them to extend to you a most hearty invitation to come to Montreal for the 1923 meeting. I can assure you that you will receive there a most hearty welcome. Montreal is decidedly a convention city. We have very suitable places for holding conventions. We will do the very best we know how to make the event a satisfactory and a very memorable one for you all. It is very easy to get to Montreal by rail or by water.

I have also here today with me a letter from one who was very familiar to the former generation of veterinarians, and I presume he is still known to a great many of you here present today. I refer to Dr. Duncan McEachran. I have a long letter from him saying he will be most happy not only to have you come to Montreal, but if time permits and you feel able to do so, he will be most happy to receive you at his own house and give you a happy, hearty entertainment there in person. I hope sincerely that we shall have the pleasure of greeting the members of the American Veterinary Medical Association in Montreal in 1923. (Applause.)

DR. D. A. IRVINE: I speak as President and representative of the Ontario Veterinary Association in supporting the Montreal Association with their invitation to meet with them in Montreal next year. I will take no more of your time. (Applause.)

DR. TORRANCE: If the Association decides to come to Montreal next year, I think I can guarantee the presence of two or more representative members of our profession from England and from the Continent. It is some time since we have had the presence of distinguished men from the other side of the water, and I have the assurance of men who are able to give that assurance with every confidence that it can be carried out, and if the meeting is held in Montreal we can get representatives of our profession to attend from England, France and Belgium. I am sure that their presence at one of our Association meetings would add a great deal to its attractiveness. (Applause.)

DR. SPENCER: I desire to bring an invitation to this Association from the livestock interests of the Middle West. Omaha is located in the heart of the great livestock industry. A large per cent of the members of the American Veterinary Medical Association live in that territory, and it seems to me that it is important that we consider future prospects in locating our next meeting. We have in that locality 500 or 600 eligible veterinarians who would be good prospects if we could bring the meeting close enough to them so that they could attend. I happen to be Resident Secretary for the State of Nebraska, and I made an active campaign this year trying to get new members for our Association. I have found that the practitioners have put up the argument that they could never attend the American Veterinary Medical Association meetings because they are too far away. Now if we can bring this Association meeting to a central location where our present members can attend and where we will have the prospects of 300 or 400 additional members, I believe that it is worth while.

Besides the livestock industry, we have invitations from the Omaha Chamber of Commerce, the Nebraska Stock Growers Association, the Omaha Live Stock Exchange and several others. We shall be glad to have you come to Omaha; we are prepared to take care of you; we have ample facilities for handling the crowd that may come, and we have entertainment features that are unique. Those of you who have been through Omaha know something of the show that is put on there every year. It is done by an association of 6,000 or 7,000 business men, formed for the purpose of entertaining conventions and organizations that come to our city. We believe that it is the logical place for the next American Veterinary Medical Association meeting, and we will take care of you if you will come and visit us. (Applause.)

DR. H. B. TREMAN: On behalf of the Missouri Valley Veterinary Medical Association, I wish to second the invitation to the city of Omaha for the 1923 meeting.

DR. C. H. STANGE: This is the third time the veterinarians of Iowa have extended to this Association an invitation to meet in Des Moines, twice by coming before the Association and once by inviting the Association through the Executive Board. We don't have some of the refreshments that you might find in Canada, but we have lots of corn, and if those who have the little stills will bring them along, you will be all right. We haven't a great many other entertainment features, but we have in Iowa over 800 graduate veterinarians. We have State association meetings with an attendance of over 450, which shows the interest our veterinarians take in association work.

We believe that if you want to meet somewhere where it will be for the best interests of the Association, if you want to increase your membership, if you want to get in close touch with

the real agricultural problems, you can do no better than to come to the heart of the agricultural district—Des Moines, Iowa. (Applause.)

ELECTION OF OFFICERS

PRESIDENT KINSLEY: We are ready to report on the election of Vice-Presidents. They are as follows: First Vice-President, Col. J. A. McKinnon; Second Vice-President, Dr. T. H. Ferguson; Third Vice-President, Dr. M. C. Baker; Fourth Vice-President, Dr. G. H. Hart; Fifth Vice-President, Dr. J. H. McNeil. I declare the five names read elected as Vice-Presidents. (Applause.)

The vote on Executive Committeeman at Large shows a total of 175 votes. Dr. Way received 103, and is, therefore, elected the Member at aLrge. (Applause.)

DR. WAY: It is almost impossible for me to express to you my appreciation for this honor. Being a practitioner, I feel keenly the problems of the veterinary profession, especially in reference to the practitioners throughout the country. I trust that the members of the Association as a whole may at any time feel free to give constructive suggestions, criticisms, etc., that I may in any way assist in the futherance and the advancement of the profession through the membership on the Executive Board. These problems, it seems to me, are vital at this time. There are many questions relative to veterinary practice which must necessarily be considered in this reconstruction period and in this period when veterinary medicine is taking up more and more the question of prophylaxis and preventive medicine. I thank you sincerely for this honor, and I hope that I may be able to serve in a way that will be commendable and satisfactory to this Association. (Applause.)

PLACE OF NEXT MEETING

PRESIDENT KINSLEY: Are there any other invitations to be presented at this time?

DR. DEVINE: When I listened to the various invitations and saw the facial expressions of some of the older members, I realized what they suffered the past two years. In all fairness to them, and particularly to myself, I urge that we go to Canada. (Applause.)

PRESIDENT KINSLEY: Do you wish to vote and give an expression of choice to the Executive Board, or do you wish to decide the location of the meeting place at this time?

(General opinion seemed to be to decide the location at this time.)

(On motion of Dr. Hernsheim, seconded by Dr. Torrance, it was voted to go to Montreal for the 1923 meeting.)

PRESIDENT KINSLEY: According to your instructions and your voting, the next annual meeting will be held in Montreal.

SECRETARY MAYO: In a way I am very glad that the Association has decided to go to Montreal. There has not been a meeting held in the Northeast for many years, not since the Toronto meeting. In this Association we do not consider the imaginary line that stretches across the country. As this Association is exerting every year a more powerful and wide-reaching influence upon the veterinary profession of other lands, I believe that while our attendance may not be as large probably because of the distance, it will benefit our Association and our profession as a whole to go to Montreal next year. I hope that every one of you will begin to plan now to take this trip to Montreal. Most of you can do it, and it will be, I assure you, one of the great events of your lives if you have never been in that country. It will be a trip that you will look back to with great pleasure the rest of your life. (Applause.)

REPORT OF LIAUTARD MEMORIAL COMMITTEE

PRESIDENT KINSLEY: We have some very important committee reports. First we will have the report of the Liautard Memorial Committee, Dr. DeVine.

DR. DEVINE: Dr. W. Horace Hoskins, I believe, was the chairman of this committee, and he having died, as you know, the President asked me to assume the chairmanship. Unfortunately we have not been able to do anything constructive. All I can report is progress.

(On motion of Dr. DeVine it was voted that the report be received.)

REPORT OF COMMITTEE ON NECROLOGY

PRESIDENT KINSLEY: Next we have a report of the Committee on Necrology, Dr. Bemis.

(Dr. H. E. Bemis read the report, which follows.)

The committee on Necrology regrets to report the loss through death of fifteen faithful members of this Association to whom we are pleased to pay tribute at this time. A number of prominent veterinarians not members of this Association have also been lost to the profession. Most notable of these is the world famous Dr. Jacob Albrechtsen.

Among laymen whose work has been closely allied with many of our problems and who have ever been in sympathy with the work of the veterinarian but have now passed on we wish to mention Hon. W. C. Edwards, Senator in the Canadian Parliament and at one time member of the International Commission on Tuberculosis, and Dr. Henry P. Armsby, Director of the Institute of Animal Nutrition in the Pennsylvania State College. Records of their achievements are given in the JOURNAL for November, 1921, and January, 1922, respectively.

R. A. Archibald

Dr. R. A. Archibald, President and Manager of the Western Laboratories, Oakland, California. Dr. Archibald was born in Queens County, Ireland, in 1870. He came to the United States in 1887, entered the Chicago Veterinary College, and graduated in 1891. After graduating he specialized in bacteriology and became a promi-

nent worker in that field. He held the following positions successively: Assistant Bacteriologist of the City of Oakland, Professor of Bacteriology in Oakland College of Medicine and Surgery, and later a similar position in San Francisco Veterinary College. He was in charge of the food inspection and sanitary work in Oakland for sixteen years. During all of this time he was very active in association work, being three times elected President of the California State Veterinary Medical Association, Fourth Vice-President of the A. V. M. A. in 1914, and President in 1916. During the last five years he was a member of the Executive Board.

Among Dr. Archibald's contributions to veterinary literature may be mentioned the following papers: "Apparent Inconsistencies of Biological Diagnostics," "Preliminary Report on the Value of Leukocytic Extract from a Therapeutic Standpoint," "The Laboratory and Its Relation to Medical Science."

Dr. Archibald had been in poor health for three years following an attack of influenza, and died February 4, 1922. This marks the passing of one of the veterinary leaders of the Pacific Coast and a tireless and valued worker for the good of the veterinary profession in America.

Charles H. Babcock

Dr. Charles Henry Babcock was born October 16, 1865, and died on the anniversary of his fifty-sixth birthday. In early life he was engaged in the drug business but later completed the course in veterinary medicine and established himself at New Rockford, North Dakota. He was always very active in public affairs, being a member of the Board of Education of his city for several years and a member of the State Veterinary Medical Examining Board under three Governors. He was a prominent Mason and a faithful member of the A. V. M. A.

A. E. Cherry

Dr. A. E. Cherry was born in 1883 and died at Denver, Colorado, March 3, 1922. He was a graduate of the Michigan Agricultural College in 1915 and joined the A. V. M. A. in 1916. He had been in Government service at Manila and Fort McKinley, Philippine Islands, and later at Stotsenburg and Pampanga. Further details of his service have not been obtained.

J. A. Couture

Dr. J. A. Couture was born in Canada in 1850 and died March 12, 1922. He was one of the first graduates of the Montreal Veterinary College and after graduation became a skillful practitioner and a very diligent worker in the Department of Agriculture. He was at one time Superintendent of the Animal Quarantine Station at Levis and is given credit for preventing the spread of foot-and-mouth disease and contagious pleuropneumonia.

Dr. Couture was actively interested in improving the livestock situation in his community and in this way gained the love and confidence of a large number of farmers and stockmen. A beautiful tribute to Dr. Couture by Dr. F. Torrance was published in the May number of the JOURNAL.

Edgar W. Finley

Dr. Edgar W. Finley of Elwood, Indiana, died in May, 1922. The date of his birth has not been obtained. He graduated from Indiana Veterinary College in 1916, served in France during the World War, and located after his return in Elwood, where he was engaged in the practice of his profession.

Nelson T. Gunn

Dr. Nelson T. Gunn was born in 1880 and died of heart failure at Butte, Montana, November 28, 1921. After spending two years in the study of medicine at Leland Stanford University, he took up the study of veterinary medicine at San Francisco Veterinary College and graduated in 1915. For one year after graduation he was engaged in meat-inspection service at South Omaha, after which he took up practice at Butte, and was apointed District Deputy State Veterinarian. He was a member of the Montana Veterinary Medical Association and served as its President in 1918 and Secretary in 1920. He was secretary of the State Board of Veterinary Examiners at the time of his death. His pleasing personality and professional ability made his work as a State official a marked success.

Jacob Helmer

Dr. Jacob Helmer was born August 26, 1859, at Brandt, Pennsylvania, and died at Scranton, Pennsylvania, October 31, 1921. After finishing his work in the public schools he studied for two years at the State Normal School at Oswego, New York. In 1885 he entered the New York State Veterinary College. In 1891 Dr. Helmer became veterinarian to the Delaware. Lackawanna and Western Railroad Company, which position he held until his death. He had always been active in association work, having served as President and Secretary of the Pennsylvania State Veterinary Medical Association, member of the State Board of Veterinary Medical Examiners for fourteen years, and a member of the A. V. M. A., where he served for two terms as Secretary of the Division of Associated Faculties and Examining Boards.

Willard Linn

Dr. Willard L. Linn was born January 9, 1868, and died at Holcomb, Illinois, November 24, 1921. Dr. Linn graduated from the Chicago Veterinary College in 1890 and joined the A. V. M. A. in 1920. He was a member of the Illinois Veterinary Association and was an Assistant State Veterinarian.

Henry S. Lewis

Dr. Henry S. Lewis died of pneumonia January 24, 1922, at Chelsea, Massachusetts. Dr. Lewis was a graduate of the Veterinary School of Harvard University in the class of 1889. He joined the A. V. M. A. in 1899 and was a member of the first veterinary examining board for the State of Massachusetts.

Charles H. McVeigh

Dr. Charles H. McVeigh died at Hanna, Alberta, Canada, January 2, 1922. He was a graduate of the Ontario Veterinary College in 1900 and joined the A. V. M. A. in 1921. He was an inspector in the Health of Animals Branch of the Department of Agriculture and did his work in the Province of Alberta. The committee has no further knowledge concerning his achievements.

Arthur M. Perry

Dr. Arthur M. Perry was born in Van Wert, Ohio, December 10, 1883, and died in Omaha, Nebraska, September 29, 1921. He graduated from Cincinnati Veterinary College in 1916 and engaged in practice until appointed veterinary inspector in the Bureau of Animal Industry in 1917. He joined the A. V. M. A. in 1918. At the time of his death he was supervising inspector at one of the large packing establishments at South Omaha.

L. I. Walch

Dr. L. I. Walch was born at Burden, Kansas, in 1895 and died at St. Paul, Minnesota, January, 1922. He graduated from St. Joseph Veterinary College in 1918 and joined the A. V. M. A. in 1919. He was a second lieutenant in the United States Army and served with honor in France during the World War.

H. A. J. Winsloe

Dr. H. A. J. Winsloe was born in Liverpool, England, January 22, 1874, and came to America at the age of eight years. He died at Copperstown, North Dakota, November 22, 1921. Dr. Winsloe graduated from the Ontario Veterinary College in 1897 and joined the A. V. M. A. in 1911. He was engaged in the practice of his profession and had served as Assistant State Veterinarian of North Dakota. His home papers paid unusual tribute to him as a father, husband and citizen, beloved by the entire community.

William L. West

Dr. William L. West died at Belfast, Maine, in December, 1921. The committee regrets that it has little information concerning Dr. West other than that he was a member of the A. V. M. A.

William J. Waugh

Dr. William J. Waugh, of Washington, Pennsylvania, died August 16, 1922, at the age of 63 years. He was a graduate of the Ontario Veterinary College. He served as a civilian veterinarian in the United States Army under the old organization. For the last few years of his life he was connected with the Pennsylvania Bureau of Animal Industry while engaged in practice at Washington, Pennsylvania.

Jacob Albrechtsen

While this noted gentleman was not a member of the A. V. M. A., the Committee on Membership had decided to recommend that he be extended an invitation to be our guest at this meeting, and undoubtedly he would have been elected to honorary membership at this time. On account of his valuable contributions to our knowledge on the intricate problems connected with sterility among animals, it seems fitting that a brief review of his life work be recorded by this association.

Dr. Albrechtsen was born at Askely on the island of Moen, Denmark, October 14, 1859, and died at Copenhagen on September 11, 1921. During his early life he was a sailor and as such he visited many foreign lands. He later entered the Danish Veterinary College, from which he graduated in 1886 and began the practice of his profession at Nexo. All through his career he paid particular attention to the diseases of cattle. He did a great deal of work in combating tuberculosis through the Bang method. Later his special interest centered in the subject of sterility in cattle and mares, and it is in this connection that his name is known the world over. Among his writings on this subject are his first book, "Sterility in Cattle and Its Treatment," published in 1908, and "Sterility in Cattle, Its Causes and Treatment," which was published in 1916.

In the death of Dr. Albrechtsen the veterinary profession has lost a tireless worker, a keen observer and in every way a noted gentleman.

Resolutions

The following resolutions are proposed:

Whereas, It has pleased God to transfer to other fields of activity our members, friends and coworkers, R. A. Archibald, Charles H.

Babcock, A. E. Cherry, J. A. Couture, Edgar W. Finley, Nelson T. Gunn, Jacob Helmer, Willard Linn, Henry S. Lewis, Charles McVeigh, Arthur M. Perry, L. I. Walch, H. A. J. Winsloe, William L. West, W. J. Waugh, and Jacob Albrechtsen;

And whereas, No one of these can be removed without there being a realization of our loss and a desire to help carry the burden of sorrow;

Therefore be it Resolved, That we as an Association do now acknowledge the loss of these friends and coworkers in the building of the veterinary profession;

And be it further Resolved, That our sympathy be expressed to the members of the families of each of the departed and a copy of these resolutions be spread upon the records of this Association.

The wives of at least two of our members, Dr. Guy S. Jones of Rockwell City, Iowa, and Dr. C. A. Schaufler of Philadelphia, Pennsylvania, and the wife of one of our most faithful friends, Dr. N. Rectenwald of Pittsburg, Pennsylvania, have been taken from them during the year.

Therefore be it Resolved, That these members be extended the warmest sympathy of this association in an attempt to help them bear this the greatest of all sad bereavements, and that a copy of these resolutions be spread upon the records of this Association.

A. H. BAKER,
J. W. CONNAWAY,
W. B. CRAIG,
G. A. JOHNSON,
H. E. BEMIS, *Chairman.*

On motion of Dr. Hoskins the report was received.

REPORT OF COMMITTEE ON ABORTION

PRESIDENT KINSLEY: The next on the program is a report of the Committee on Abortion, Dr. Fitch.

DR. C. P. FITCH: The printed report will be presented as it is, but we have two other items that I wish to bring to your attention as a part of the report.

As you will note from reading the report, there are a number of facts and factors in connection with abortion disease which are yet very imperfectly understood. We would, therefore, urge that this Association take action to urge the experiment stations, research workers and all institutions engaged in the study of animal diseases to concentrate their efforts so far as is possible on the study of this infection to see if it is not possible to obtain the answer to a number of the questions which still remain unanswered.

At the meeting at Denver a subcommittee was appointed to study and standardize methods for the tests for this disease, and this subcommittee reports as follows:

The subcommittee of your Committee on Abortion, appointed to investigate and to make recommendations for the standardization of the biological tests for bovine infectious abortion, has found its task to be larger and more complicated than it at first believed it to be, or than is generally recognized.

The subcommittee has done a considerable amount of work during the year, particularly with regard to the agglutination test. The character of the suspensions of abortion bacilli to be used in this

test, the differences in the results obtained with the test through the use of different strains of abortion bacilli, the effects of different methods of growing the bacteria for suspensions, the effect of different preservative agents on suspensions, and various other factors which it does not seem necessary to enumerate at this time, have been studied, but should receive further attention before the results obtained can be correctly interpreted or should be reported.

The subcommittee recognizes that its work should be continued, and recommends that either it or a similar subcommittee with a different personnel should be active in the matter.

J. M. BUCK,
G. T. CREECH,
W. E. COTTON.

Dr. Fitch then read the printed report of the Committee on Abortion, which follows:

In its report of 1920 the Committee on Abortion presented a brief summary of the available knowledge on the disease widely prevalent throughout the world and variously known as slinking and dropping of calves, contagious, infectious and epizootic abortion, abortion disease, etc. This report was very favorably received, both because of its brevity and the direct and positive manner in which the statements it contained were made. Hence, your committee of this year, realizing that the latest obtainable knowledge on bovine infectious abortion, concisely and clearly stated, is urgently needed by all members of the profession, has concluded to present a report this year embodying additional information to the report of two years ago.

Name.—Though cattle may abort from various causes, only one kind of infectious abortion among cattle has been found to be both widespread and common. For this evil after due consideration it is recommended that the name bovine infectious abortion be retained.

Definition.—Bovine infectious abortion is characterized as a rule by an interference with the development of the fetus, frequently resulting in its premature expulsion, either dead or alive, viable or nonviable. There is also a frequent manifest inflammation of the fetal membranes and of the maternal cotyledons together with frequent retention of the afterbirth.

Cause.—The essential cause of bovine infectious abortion is *Bacterium abortus* (Bang). The proportion of abortions due to other causes is relatively small. This germ possesses peculiar biological requirements which are found in the pregnant uterus and in the udder. The microbe localizes in these places and has been found in the regional lymph nodes of the udder and uterus. In the udder it often persists indefinitely, while in the postparturient uterus it has been isolated after approximately two months, but usually can not be found after three weeks. It is commonly found in the stomach, intestines, liver and other organs of the aborted fetus.

In the bull the bacterium has been found in the reproductive organs, seminal fluid and urethral discharges. Bulls do not show so high a percentage of infection as do cows.

Bacterium abortus (Bang) has been found to remain alive and virulent for many weeks in the material in which it is expelled from the animal. It is relatively easily destroyed by disinfectants and natural germicidal agents and is not known to multiply in nature outside the animal body.

Channels of Infection.—Infection with *Bacterium abortus* (Bang) occurs through the digestive tract. That it may occur through other channels (genital tract, urethra, etc.) has not yet been definitely proved.

Channels of Elimination.—*Bacterium abortus* (Bang) is disseminated by uterine discharges, aborted fetuses and fetal membranes

of infected cows. The milk of such cows and the seminal fluid and urethral discharges of infected bulls often contain the germ.

The products of seemingly normal parturitions of infected cows, that is, fetal membranes, uterine discharges, the surface of calves and their alvine discharges, frequently harbor abortion bacilli and are dangerous.

A cow may be the carrier and disseminator of the disease without showing symptoms of her condition.

Pathology.—Bacterium abortus (Bang) produces an inflammation of the chorion and of the fetal and maternal cotyledons in the pregnant cow. No significant pathological changes have been observed in the udder and fetus. Abscessation and other changes in the genital organs have been found in the bull.

Diagnosis.—The diagnosis of bovine infectious abortion is possible through the study of the history and condition of the herd, by means of the serum tests (agglutination and complement fixation) and bacteriological studies of infected material.

Sequelæ.—In this disease complications are frequent. They include inflammation of various parts of the reproductive organs, which may lead to temporary and at times permanent sterility, and interference with milk and flesh production.

The micro-organisms most commonly found in connection with these conditions are the common pyogenic bacteria.

Prevention and Control.—The attempt to control bovine infectious abortion should conform to the principles of general sanitation and sexual hygiene, making the efforts specific in so far as our knowledge of the etiology of the disease permits. Some of the more important measures to be practiced are as follows:

(a) The use of maternity stables and pens for *all* cows that show signs of approaching parturition, and the segregation of such cows until all discharges have ceased.

(b) The isolation and care of all aborting cows and their segregation for a period of 60 days or until no evidences of abnormal conditions in or about their reproductive organs remain.

(c) Permit no animal with diseased genital organs to be served by the bull.

(d) The male animal should be kept in a separate pen apart from the herd. Breeding should be carried out on neutral ground. The female should be segregated after service, preferably so tied that she can not lick herself until all danger of leakage of infected seminal fluid from her vagina has ceased.

(e) Consider raw milk as an infective agent for all bovine animals except young calves. Precautions should be taken to prevent spilling milk from infected sources.

(f) The injection of living abortion bacilli at the proper time into members of infected herds has been shown to reduce the number of abortions. It must be kept clearly in mind that vaccination against infectious abortion has not passed beyond the experimental stage, and that the suspensions of living abortion bacilli now obtainable often are worthless. The published tests on the use of dead abortion bacilli have failed to establish their positive value in the treatment or control of abortion.

(g) The possibility of transmission of bovine infectious abortion to other species of animals, particularly swine, and from swine to other animals, particularly cattle, should be given proper attention and measures inaugurated which would effectively prevent transmission.

A. EICHHORN,
T. H. FERGUSON,
E. C. SCHROEDER,
F. M. HAYES,
C. P. FITCH, *Chairman.*

On motion of Dr. Fitch, the report was received.

REPORT OF COMMITTEE ON PREVENTION AND CONTROL OF ANIMAL DISEASES

PRESIDENT KINSLEY: The next on the program is the report of the Committee on Prevention and Control of Animal Diseases, Dr. Turner.

(DR. TURNER read the report, which follows.)

At the 1921 meeting of the American Veterinary Medical Association at Denver, Colorado, a paper was presented on "The Importance of Preventive Measures in Repressing Animal Diseases." It contained the following suggestion: "We recommend that this association appoint a committee on disease prevention to consider the above suggestions and make additions; that the committee report at the next meeting of this Association." This recommendation was duly adopted, and in accordance therewith President Kinsley appointed the following committee: George H. Hart, I. E. Newsom, Leon G. Cloud, U. G. Houck, Henry W. Turner, Chairman.

In this report we have considered disease prevention from the standpoint of prevention of transmissible diseases of animals and poultry. It was decided to present it in the form of a descriptive outline. A tentative one was prepared and a copy given to the members, assigning each a different part to study and report upon.

In order to facilitate the committee's work, we deemed it advisable to subdivide the subject as follows:

Causes.	Immunization.
Modes of dissemination.	Quarantine.
Hygiene.	Education.
Diagnosis.	Helpful agencies.

OUTLINE OF CAUSES

Causes:
- Predisposing causes:
  - Remote:
    - Age.
    - Sex.
    - Heredity.
    - Hygiene.
    - Labor.
    - Climate and seasons.
  - Immediate:
    - Dietetics:
      - Unbalanced ration.
      - Deficiency:
        - Mineral.
        - Vitamins.
    - Mechanical injury.
    - Association with other species of animals.
- Exciting or biological causes:
  - Animal:
    - Protozoa.
    - Metazoa.
  - Vegetable:
    - Molds.
    - Yeasts.
    - Bacteria.
  - Filterable virus.
  - Unknown virus.

CAUSES

In considering the causative factors of the transmissible diseases of the domestic animals one always has uppermost in mind how the

knowledge of these factors will assist him in devising means for prevention and control. In all the transmissible diseases there are certain predisposing factors which influence not only the incidence of infection but also to a greater or less extent the course and severity of the disease. We all know that in some affections age and heredity play important parts as predisposing factors, and for that reason we take special care to protect certain age classes against particular types of infection and to eliminate from breeding animals whose offspring regularly incline to disease.

Probably today the most serious thought in matters pertaining to the avoidance of predisposing causes is given to the subjects of hygiene and dietetics. Adequate hygiene measures include proper stable construction and management so that there is secured suitable ventilation and sanitation, as well as proper exercise and care of the animals. A good example of the practical application of such measures alone in the combating of disease is the work initiated by the Zoological Division of the Bureau of Animal Industry in McLean County, Illinois, where parasitism and some of the common bacterial infections of pigs are being successfully controlled.

The prime importance of maintaining a proper diet in the prevention of diseases can not be questioned. Evidence is accumulating to show that some of the diseases once considered strictly transmisible are quite likely caused by a deficiency in the diet. (Black tongue in dogs now appears to be a pellagra-like disease.) It has even been suggested that dietary deficiency may be one of the chief predisposing causes of hemorrhagic septicemia.

The exciting causes of the communicable diseases comprise three great classes of parasites and viruses, namely: (1) The animal parasites (protozoa and metazoa); (2) vegetable parasites (molds, yeasts and bacterial); (3) filterable viruses. A complete knowledge of these causative agents is essential in order to determine the best means of prevention and treatment of disease. In dealing with diseases caused by the first class of parasites, prevention and control are for the most part dependent on the application of quarantine and hygiene measures. The diseases engendered by the second and third classes include some in the prevention of which not only quarantine and hygiene measures find application, but also biological products are of very great value. The use of biologics in combating transmissible diseases is becoming more and more general, and for that reason it should be the aim of science not only to seek means for preparing new and more effective products, but also to eliminate as fast as possible the dangerous and worthless products now in use. Our efforts should be increased to stimulate interest and activity in research work to determine as soon as possible the causes of diseases which are now unknown.

OUTLINE OF MODES OF DISSEMINATION

Modes of Dissemination of the Causes:

Direct:

Introduction of animals or poultry:

History.
Physical and special examinations.
Animal.

Animal products:

Virus—living cultures.
Slaughtering establishments.
Reduction plants.
Hides.
Excreta.
Milk food products (unsterilized).

Indirect:
- Parasites.
- Insects.
- Birds.
- Feeds:
  - Contaminated; infected.
  - Improper; unbalanced.
- Water:
  - Streams, ponds, bogs.
- Equipment:
  - Stockyards, cars, ships.
  - Wagons, trucks, crates.
  - Public yards, watering troughs.
  - Utensils, feed sacks.

MODES OF DISSEMINATION OF THE CAUSES

In the practice of prevention of transmissible diseases of animals it is essential to understand the manner in which the exciting causes of disease are disseminated. This requires a knowledge of the agents of infection and their modes of entrance into and egress from the body, as well as the manner they are carried from animal to animal and from place to place.

Modes of infection.—Disease-producing organisms most frequently gain entrance into the bodies of healthy animals through the digestive tract, respiratory tract, generative organs, eye, and through abrasions in the skin, mucous membrane or by bites of insects or animals.

Pathogenic micro-organisms with few exceptions do not multiply outside the bodies of animals or lead anything but a parasitic life.

The specific organisms of disease are transmitted most frequently by animals through their excretions, secretions and products; either directly or indirectly by means of animal carriers or through such intermediate agencies as food, water, insects, etc., which may be infected or contaminated by pathogenic micro-organisms.

Direct infection is the transference of the specific causative organism of disease by actual contact between diseased and healthy animals. This is the most common means by which disease is spread.

Droplet infection is direct aerial infection. The infectious material is transmited directly from animal to animal through the air at short distances by coughing or sneezing.

Indirect infection.—The exciting cause of disease in this form is carried by some infected object, animate or inanimate, acting as intermediary, such as infected foods, water and air; also by insects.

Data on dissemination of disease by air are scanty. In order to convey the micro-organisms through the air it must contain dust or mist on which the organisms are carried.

Insects as indirect carriers of disease were first definitely demonstrated by Theobald Smith in 1893 in the case of the tick and Texas fever in cattle. Diseases are carried by insects in two ways, biologically or mechanically. Biologically, the insect is the intermediate host of the causative organism. Mechanically, the virus of disease may be carried in a number of ways by the contaminated insect. Insect-borne diseases generally are confined to the immediate locality of the breeding places of insects.

Animal carriers.—All infected animals are potential carriers. Some animals harbor and disseminate the specific organisms of disease without showing any recognizable symptoms. They may transmit the causative organism of disease, either directly or indirectly, and are doubtless responsible for many outbreaks of disease where the origin can not be explained.

The most authentic case of this class of infection in medical annals is that of "Typhoid Mary," the cook who left a trail of infec-

tion in three States, six families and twenty-six people. In veterinary medicine abortion disease, tuberculosis and other diseases may be disseminated in this obscure manner.

OUTLINE OF HYGIENE

Hygiene:
- Animal hygiene:
  - Individual hygiene.
  - Breeding.
  - Age.
  - Care, exercise, work.
  - Sanitary habits.
  - Herd or flock management.
  - Herd records—breeding, feeding, production.
  - Feed and water.
  - Association with other species of animals.
- Environmental hygiene:
  - Site.
  - Altitude.
  - Climate, seasons.
  - Sunlight, atmospheric conditions.
  - Topography, soils, drainage.
  - Water supply.
  - Stream pollution.
  - Sanitation.
  - Disinfection, disinfectants. fumigation.
  - Transportation carriers.
  - Building construction:
    - Relative location:
      - Residence.
      - Neighbors' buildings.
      - Hog pens and other buildings.
      - Chicken houses and sheds.
      - Paddocks and pastures.
    - Material.
    - Ventilation, light, air space.
    - Arrangement, equipment.
    - Drainage, sewage disposal.
    - Manure and urine disposal.

HYGIENE

This is a field that with a comparatively few exceptions has been given but scant attention in animal husbandry. Woeful lack of appreciation of its importance is the cause of much financial loss to the livestock industry. Regulations, municipal, county and State, in all parts of the country, forcing improved conditions under which milk production was obliged to be carried on, have greatly improved dairy farm hygiene. Moreover, premise conditions have been wonderfully improved upon in connection with the administration of transmissible animal disease control campaigns. The more artificial the breeding, production and surroundings of our herds become, the more must additional factors be brought into play to prevent disease processes. This has its direct analogous situation in the human family, which necessitated the development of elaborate hygiene and sanitary measures in our modern large cities which were unknown before they developed. Animals properly bred, fed and cared for have the constitution and stamina to carry on their functions under artificial conditions and still remain resistant to disease.

In the swine industry we see the most widespread lack of appreciation of the ordinary principles of hygiene. Factors tending to lead to poor hygienic surroundings are the ones furnishing the means

for prolonging the life of pathogenic organisms outside the bodies of the host animals. Recent observations have definitely shown that feeder steers make better gains in the open, even in very cold weather, when protected from winds and storms by sheds, than when inclosed in the ordinary barn.

OUTLINE OF DIAGNOSIS

Diagnosis:
- History:
  - Individual.
  - Herd (record of:)
    - Births.
    - Deaths.
    - Additions.
    - Removals.
- Symptoms.
- Allergic tests.
- Laboratory examinations:
  - Serological.
  - Bacteriological.
  - Pathological.
  - Animal inoculations.
  - Parasitological.
- Necropsy.

DIAGNOSIS

The final diagnosis of a disease must rest in proving the presence of the specific organism, since we are accustomed to believe that each transmissible disease is due to a single cause. The presence of the organism may be determined by means of history symptoms, allergic tests, laboratory examinations and necropsy. The method varies according to the disease under consideration and the amount of accumulated knowledge on the subject. The tendency is, however, to lay less stress on the symptoms and lesions, and more on the more recent methods which have been developed. While from the standpoint of accuracy in diagnosis all possible encouragement should be given to research workers in order that better methods may be devised, yet veterinarians should not allow the laboratory methods to lessen their keenness of perception in determining the presence of charactristic symptoms or lesions of disease. It seems that there is real danger of losing the art of physical diagnosis in depending too much on laboratory methods.

Since, however, laboratories will in the future be used more than in the past, it is quite important that the men in the field familiarize themselves with the proper selection and packing of material to be sent to laboratories, and that they also have sufficient knowledge of the limitations of the laboratory diagnostician, so that the proper value can be placed upon the report received. There is a strong probability that too much dependence is placed on the laboratory; whereas the real diagnostician should be the man who has seen all of the conditions including the laboratory report. In other words, the laboratory worker should be an aid to the practitioner in making the diagnosis, and not assume to make the diagnosis for him.

OUTLINE OF IMMUNIZATION

Immunization:
- Active:
  - Bacterins.
  - Vaccines (proven):
    - Virulent.
    - Attenuated.
- Passive:
  - Serums:
    - Antitoxic.
    - Antibacterial.

IMMUNIZATION

Before this method of controlling disease is decided upon, it should be definitely determined that there is no immediate possibility of actual eradication of the disease. Eradication should be the chief aim, and immunization used only where eradication seems impracticable. This view can be illustrated by saying that immunization against foot-and-mouth disease in the United States under our present conditions would be ill advised, whereas immunization against blackleg should be strongly urged.

Having decided on immunization, any discussion of proper agents in individual maladies would lead us too far afield and out of the confines of the territory to be covered in this report. However, a word of caution which has been expressed many times before may not be amiss here. When Von Behring found diphtheria antitoxin, the more optimistic jumped to the conclusion that by the use of similar products all infectious diseases would soon be things of the past. This optimism was short-lived, and it was soon discovered that antitoxins were possible only in very few diseases, and are practicable in a still less number. Vaccines, bacterins and antiserums have worked their miracles in the alleviation of many of our worst maladies, but each one of these agents seems to have quite definite limitations, and once these are established they should be quite definitely adhered to.

Here again liberal appropriations for research are urged, in order that immunizing agents may be developed for diseases where they are not now used, and that those at present may be improved. It must not be forgotten that typhoid bacterin as used in the English Army in South Africa was practically worthless, owing to the fact that it was heated to 60 degrees C. in its preparation, whereas a bacterin heated to from 52 to 54 degrees C. removed typhoid fever from the list of important diseases in the late war.

We recommend the action of the United States Bureau of Animal Industry in stopping the manufacture of blackleg vaccine at Government expense, since an agent that is so well known and so universally used has reached beyond the experimental stage and is no longer proper material for Government distribution. Governmental agencies are properly active in the discovery and introduction of new immunizing substances, but manufacture and distribution of well-known agents should be in the hands of commercial firms under official supervision.

OUTLINE OF QUARANTINE

Quarantine:

- National quarantine:
  - Importations.
  - Interstate movement.
  - Special quarantine.
- State quarantine:
  - County.
  - Township.
  - Municipal.
  - Premise.

Final disposition:
- Slaughter.
- Release.

- Quarantine regulations:
  - Federal.
  - State.
  - Municipal.

QUARANTINE

Since early in the history of medicine quarantine has been regarded as essential in the prevention and control of transmissible diseases. The value of quarantine depends upon the completeness of the

isolation of the animals and of the infected territory placed in quarantine. The movements of persons and animals can be controlled, but it is difficult to prevent the spread of infection from quarantined animals through rodents, birds and insects of various kinds. In order to establish the most effective quarantine, measures must be employed to prevent effectually virus from being carried from sick to well animals. The most complete quarantine ever established in this country provided for the retention of the suspicious and diseased animals on an island; they were confined to screened stalls and were constantly under the observation of attendants.

National and State livestock sanitary authorities are empowered by existing laws to establish and maintain quarantine as occasion requires for the protection of the public health and the livestock industry of the country. Uniformity in State quarantine laws and regulations would be to the advantage of all concerned, and efforts should be made to obtain such uniformity, which should be in harmony with our National laws and regulations.

OUTLINE OF EDUCATIONAL MEASURES

Educational:

Medical units:
- Veterinarians, physicians, bureaus of animal industry.
- Health departments, hospitals.
- Medical and veterinary colleges.

Institutes of learning—universities, agricultural colleges, veterinary colleges.

Associations:
- Grangers, club meetings, fairs, institutes, veterinary clubs.
- Harvest homes, stockmen's meetings, reunions.

Extension workers.

General public.

Law-enforcement agencies.

Owner, attendants.

EDUCATION

Public support is an essential factor in all disease prevention. To bring about a proper attitude the public must be educated to recognize the necessity of this important subject. After a knowledge of the predisposing and exciting causes of animal diseases and means of preventing them are ascertained by the investigator, this knowledge must be disseminated to the profession, the stockman and the general public in order for it to be applied. Only so rapidly as the truth in regard to disease processes after being elucidated is generally accepted, just so rapidly will progress be made in disease prevention. Failure on the part of the public, due to lack of sufficient education, to accept scientific knowledge in regard to disease has been a potent factor in retarding progress of prevention. Thus in the Texas fever tick eradication, as long as ten years were required to free a comparatively small area of the tick, but after such a demonstration and the consequent public acceptance of the same, all the rest of some States were cleaned in half the time required to clean the small area.

Once education by means of the spoken, writen and printed word and by demonstrations has been accomplished, progress is comparatively rapid. It is important in such education that truths only be given wide dissemination. Efforts to educate must be directed along constructive lines and great care used by men in positions of responsibility and leadership not to overestimate the value of certain truths, thereby giving a false sense of security which may result in loss of confidence or severe reaction of mass opinion. For example, it is just as important to lay stress on the limitations of the tuber-

culin test as it is to extend the knowledge of its essential place in preventing the spread of tuberculosis. All phases of the industry involved must be considered in educational programs. Efforts should be made to overcome the lethargy and indifference of so many stockmen in regard to disease until it is actually decimating their flocks or herds.

There are at present many agencies for disseminating information in regard to animal disease prevention which are tabulated. The veterinary profession must continue to be the source from which the subject matter for this purpose is derived. At times leads from researches in human medicine have been of valuable assistance, just as scientific facts elucidated in comparative medicine have opened the way for the amelioration of human ills. Veterinarians must therefore recognize the responsibility of leadership in regard to animal disease prevention and keep informed in regard to its various phases, even though they may not for the present be directly interested in preventive educational campaigns and control measures. While the record of the profession stands high in the application of preventive medicine, great things are still before us to be accomplished. Our veterinary colleges can be of service in this regard by instilling into the minds of prospective veterinarians early in their college curriculum the importance of this phase of our activities. While we are not ready at this time to suggest that veterinary students, during their professional curriculum, should specialize in disease prevention, as has been suggested for the medical students in order to turn out properly trained public health officials, we nevertheless feel this is a matter that should be placed before the veterinary student body in such a way as to show them the advantages of it to their future, whether they are in the rôle of public official or practitoner.

OUTLINE OF HELPFUL AGENCIES

Helpful Agencies:

Sterilization, pasteurization.
Health surveys, statistics.
Enforcement methods.
Muzzling, dipping.
Special measures for special diseases.

HELPFUL AGENCIES

In the prevention of transmissible diseases of animals all agencies which may assist in any way should be considered and used.

Sterilization or disinfection should be employed to destroy any pathogenic micro-organisms that might be transmitted through the use of contaminated equipment.

Pasteurization should be used where there is danger of conveying disease-producing organisms through food or drink.

Health surveys to determine the extent of transmissible diseases should be made by trained and efficient investigators so as to enable regulatory authorities to prevent the spread of disease. In making these health surveys careful consideration should be given to every species of animal that might be affected, susceptible, or that might be a means of transmitting the disease. Accurate records should be kept of such surveys and filed with the proper authorities for reference in making future investigations or in compiling statistics. Accurate and reliable statistics should be published so that not only the amount of infection can be estimated, but in order that the losses can be shown to lay stress upon the importance of the use of preventive measures.

Proper quarantine methods and enforcement of sanitary measures are important agencies to be employed in the suppression and control of transmissible diseases.

In some diseases more strict regulations and measures must be used than in others, as in foot-and-mouth disease, anthrax, glanders and hog cholera.

State livestock sanitary officials should have full charge of livestock enforcement laws in every State and should be assisted by county officials in the enforcement of laws when they come within the bounds of such county.

Muzzling and proper confining of animals affected with certain diseases should be strictly adhered to and are very essential in controlling such a disease as rabies. Some diseases that are caused by parasites can be controlled or exterminated by one or a series of dippings. Dipping is used principally in the control and prevention of splenetic or Texas fever and scabies. These methods have proved effectual as well as economical to the livestock industry of the infected districts.

All of these agents are essential and should be kept in mind when combating transmissible diseases.

Briefly, this completes the work of the initial Committee on Prevention of Transmissible Diseases. This report has dealt with the subject in a general way. However, we would suggest that a committee of similar function be continued in this Association, and that future reports should be confined to specialized topics.

GEORGE H. HART,
U. G. HOUCK,
L. G. CLOUD,
I. E. NEWSOM,
HENRY W. TURNER, *Chairman.*

PRESIDENT KINSLEY: This is a special committee, and if it is your desire that the committee be continued you should make a motion accordingly.

DR. TORRANCE: I move the report be received and the Commitee continued.

(The motion was seconded and carried.)

(Proceedings to be continued)

PROFESSIONAL INTERESTS GUARDED IN FRANCE

In France there is a "National Syndicate of Veterinarians" which is very watchful in guarding the interests of the profession. This organization recently protested to the Ministry of Agriculture against the designation of two persons as "veterinarians" in an award announced in the *Official Journal*, when those persons were not graduate veterinarians and were therefore not entitled to that title. Investigation developed the fact that the men were merely practitioners of castration. An official correction was published.

In another case an empiric was prosecuted for appropriating the title "veterinarian," with the result that, in addition to a fine of 300 francs, the judgment was ordered to be advertised and posted at his expense.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

The thirty-eighth semi-annual meeting of the Veterinary Medical Association of New Jersey was held at Asbury Park on July 13 and 14, with headquarters at the Hotel Marlborough.

There was a large attendance of members, their wives and friends.

A very interesting program and social time was enjoyed. The Hon. C. E. F. Hetrick, Mayor of the city, being unable to attend, sent a representative to welcome the association to the city.

A delegation of officers from the U. S. Army explained the Officers' Reserve Corps and requested a few veterinarians to join. The association took action to cooperate with the Army relative to seeing that New Jersey furnished her quota of reserve veterinarians.

Mr. C. D. Cleveland, of Eatonstown, presented the statistics of the dairy industry in New Jersey, to the association. His talk caused a long discussion on milk problems, with special reference to pasteurization and tuberculin testing.

Mr. Hunter of Annandale gave a talk on swine problems confronting a breeder.

Dr. Cassius Way of New York covered the subject of breeding problems very thoroughly. He thinks immunity to abortion is established. New outbreaks are due to new infections from different organisms. The most difficult condition he and his assistants feel they have to deal with is inflammation of the genitals. He demonstrated the use of a forceps to attach to each side of the cervix uteri to draw out the anterior wall of the vagina and cervix for examination.

Dr. Wm. Gall told the association the system he used in eradicating tuberculosis from Mattawan's milk supply. He said 14 per cent of the cows supplying Mattawan were tuberculous.

Dr. Way made the statement that human glandular tuberculosis of bovine origin is as rare in New York today as glanders, due to the pasteurization, tuberculin testing, and certification of milk. The pasteurization of certified milk is now being contemplated in order to check diseases spread by man.

Dr. E. W. Smillie of the staff of the Rockefeller Institute for Medical Research read an article on the experiments carried on by Dr. Theobald Smith and his assistant, Dr. Little, on the significance of colostrum to the new-born calf and the use of cow serum as a substitute.

These experiments seemed to indicate that colostrum checked the prevalent trouble of calf scours. Cow serum given per os seemed to be a good substitute while serum per os and intravenously gave excellent results.

These are new experiments that may prove of great benefit to the stock industry.

These papers, together with further experiments, are to be printed in the *Journal of Medical Research*.

Dr. B. M. Lyon of Pearl River gave the history of the discovery of the single-dose vaccine against rabies in dogs. He gave great credit to the Japanese who first prepared it.

From the experiments carried out in the United States and the trials given this single-dose method in actual outbreaks, it appears to rank with the smallpox and hog-cholera vaccine for efficiency.

A very pleasant social time was enjoyed by all. An orchestra concert and singing were given in the Ocean Grove Auditorium. Some enjoyed the dancing on the pier, while others took in, or were taken in by, the various amusements common to the seashore resorts.

A dip in the ocean and a stroll along the boardwalk were additional attractions.

The 39th regular annual meeting will be held in Trenton, N. J., on the second Thursday in January with headquarters at the Trenton House.

At this meeting the election of officers and regular routine business will be transacted.

P. B. SILVESTER, *Secretary.*

MONTANA VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Montana Veterinary Medical Association was held at Billings July 26 and 27, 1922. About thirty-five veterinarians were present at the meeting, and the attendance at every session during the two days was practically 100 per cent.

The morning session of the first day was devoted to business and the address of the retiring president, Dr. C. H. Stevens. The afternoon and evening sessions were occupied with a number of very interesting and instructive addresses and papers. A very successful clinic was held under the general direction of Dr. N. B. Smith of Billings during the forenoon of the second day. The association was entertained with a dairy lunch at the Yellowstone Creamery, followed by an address by Mr. V. E. Sampsel, president of the Yellowstone Creamery Company. After lunch a clinic was held at the Yellowstone Packing Company on two reactors to the tuberculin test. An afternoon meeting was then held, at which several papers were read, and the new business of the association was transacted, including the election of officers. The business of the association having been completed, the evening of the second day was devoted to relaxation in the form of the annual banquet, followed by a musical program and a number of snappy after-dinner talks. A feature of the evening was a short visit from the Assistant Secretary of Agriculture, C. W. Pugsley, who was in Billings for a short time on a trip across the State.

In connection with this meeting a conference of Federal inspectors and State district deputies was held, to discuss the cooperative work in eradication of tuberculosis.

The following addresses and papers were delivered:

"Purification of Farm Water Supplies by Chlorination," Dr. R. C. Main, City Health Officer of Billings.

"Feeding In Its Relation to Disease," Dr. W. J. Butler, Helena.

"Coccidiosis In Cattle," Dr. E. D. Nash, Helena.

"Hemorrhagic Septicemia in the Buffalo in Yellowstone Park," Dr. Neil Plank, U. S. Bureau of Animal Industry.

Address by W. L. Stockton, President of the Montana Dairymen's Association.

"Production of Clean Milk," R. J. Posson, Market Milk Specialist, U. S. Bureau of Animal Industry.

Review of Report of the Tuberculosis Conference in Chicago, Dr. Rudolph Snyder, U. S. Bureau of Animal Industry.

Address by Mr. V. E. Sampsel, President of the Yellowstone Creamery Company.

"Epithelioma of the Eye in Hereford Cattle," Dr. M. E. Knowles, Helena.

"Veterinary Problems of the Summer Range," Dr. A. C. Morrow, Dillon.

"The County Agent and the Veterinarian," Dr. H. Welch, Bozeman.

Mr. J. H. Burke, President of the Montana Stockgrowers' Association, was to have addressed the meeting, but was unable to attend.

The officers elected for the coming year were: O. L. Devore, of Bozeman, President; W. E. Heath, of Columbus, Vice President; and H. Marsh, of Helena, Secretary-Treasurer.

The 1923 meeting will be held at Helena.

HADLEIGH MARSH, *Secretary.*

ONTARIO VETERINARY ASSOCIATION

The annual meeting of the Ontario Veterinary Association was held in the Recreation Room of the Harris Abattoir on August 9 and 10. While the attendance was not so large as at the winter meeting, the enthusiasm was great, and everyone appeared to think that his time was well spent listening to the various addresses or joining in the discussions.

In his opening address, the President, Dr. J. A. Campbell, observed that the association was paying attention at this convention to subjects that had heretofore not been featured—"The Better Sire Campaign," "The Poultry Industry," and "Bacon Grading." He urged the necessity of the veterinarian in the future asserting himself as an authority on these subjects. Dr. Campbell referred to the visit of a deputation representing the O.V.C. to the Hon. W. R. Motherwell urging the provision of more adequate laboratory facilities for coping with animal diseases and for research work along veterinary lines. He stated that there was every indication that this visit would bring definite results in the near future.

The minutes of the last annual meeting were read and adopted, and the Secretary handed in his resignation, which was not accepted. It was moved by Dr. Morgan of Shelburne, seconded by Dr. Short of Erin, that the association pay a fixed yearly sum to the Secretary.

Dr. T. B. Buckley moved that the fee to the Ontario Veterinary Association be raised to five dollars, this fee to include subscription to the *Canadian Veterinary Record.* Dr. Bur-

rows seconded this motion which was carried without much discussion.

Letters from the following were read, regretting their inability to be present: Drs. H. Perley and J. H. Blattenburg and the Hon. Manning W. Doherty.

The election of officers next took place, Drs. Torrance and McGilvray acting as scrutineers. The officers elected for the ensuing year are: President, D. A. Irvine, Toronto; 1st Vice President, T. B. Buckley, Toronto; 2d Vice President, C. L. Morgan, Shelburne; Executive Committee, H. E. Batt, Guelph; D. R. Caley, Bracebridge; J. Dunn, Barrie; W. J. R. Fowler, Toronto; C. D. McGilvray, Guelph (ex-officio member). Secretary-treasurer and Registrar, J. S. Glover, Toronto; Legislative Committee, O. H. Duncombe, Waterford; J. P. Fitzgerald, Hillsdale; J. C. Brown, Burford. Educational Committee, A. R. B. Richmond, Toronto; J. McFadzean, Arthur; W. J. Morgan, Kingston; J. Porter, Brantford; J. Short, Erin; W. J. Wilson, London; W. A. Thompson, Washago; Auditors, R. Gwatkin, Guelph; W. W. Forsyth, Toronto. The representatives to the various fairs have yet to be appointed.

The auditors presented their report at the beginning of the afternoon session, stating that they had examined the books and found them correct, with a credit balance of $130.96. It was moved by Dr. Tennent, seconded by Dr. Buckley and carried that the auditors' report be accepted.

Discussion then followed concerning the A. V. M. A. and it was moved by Dr. McGilvray, seconded by Dr. Fowler and carried, that an invitation be extended to the association for them to hold their next annual meeting in Canada.

"The Relationship of Sweet Clover to an Acute and Fatal Disease in Cattle," was then presented by F. W. Schofield of the Ontario Veterinary College. Dr. Schofield in his address stated that this disease was first brought to their notice last December and that experiments and postmortems indicated that its cause was sweet clover ensilage and hay. Only moldy ensilage or hay is apparently the cause. A brief report of the work done in this investigation was inserted in the last issue of the *Canadian Veterinary Record*, and a further report is being prepared.

The next paper, "Better Sires," was by R. Wade, Director of the Livestock Branch, Ontario Department of Agriculture. He

remarked that the veterinary profession could only flourish where stockmen were convinced of the value of good livestock. The "Better Bull Campaign," which his department has been carrying on for the past two years was fully explained, and shown to be a very progressive movement. Mr. Wade concluded his excellent address by saying that it had been proven that good livestock was more essential from a financial standpoint than good crops.

Thomas Olsen of the Harris Abattoir next addressed the meeting on "Hog and Bacon Grading in Canada." In his address he pointed out the vital necessity of improving the bacon type of hog in this country if Canada wished to market her bacon in England. The Danish farm systems of cooperative breeding, growing, killing, packing and selling were described, and grading after killing was advocated by the speaker. He claimed that Yorkshire swine would put Canada on the map as a raiser of good bacon.

After this entertaining and instructive talk Dr. McGilvray suggested the advisability of the association framing a resolution respecting rail grading to be forwarded to the proper departments.

The afternoon session concluded with an address by C. H. Higgins of New York, who spoke on the necessity of more observation by the average veterinarian. He also touched on "service," stating that the men who can provide the service can get the money.

Robert Barnes, Chief Inspector, Meat and Canned Foods Act, who has recently been appointed President of the Canadian National Poultry Association was the first speaker of the evening. His address, "The Relation of the Poultry Industry to the Veterinarian" contained many outstanding facts. He impressed on his hearers the need for a better knowledge of the prevention and the control of poultry diseases, and remarked that the man who can put "caponizing and the treatment of poultry diseases" on his shingle will be helping both himself and the industry.

The next speaker was T. P. White, Assistant Chief, Hog Cholera Control Division of the B. A. I., who spoke on "Swine Diseases." He mentioned the difficulties encountered in the United States in the control of hog cholera owing to different laws existing in different States, and compared this condition

with the method in Canada where the Ministry can enforce the law throughout the Dominion. Various diseases of swine were ably dealt with by the speaker.

The last address was by F. Torrance, Veterinary Director General, who stated that only $5,000 was lost in animals through hog cholera in Canada last year. He then proceeded to give an interesting talk on veterinary science in Canada, pointing out the tremendous field in the fox-farming industry.

Two instructive films were shown at the conclusion of Dr. Torrance's address, one dealing with tuberculosis and the other with roundworms in hogs.

Some discussion took place at the beginning of the second day's session concerning the relationship existing between the Ontario Veterinary Association and the Ontario Humane Society, and it was moved, seconded and carried that a committee be appointed from the Ontario Veterinary Association to interview the Ontario Humane Society with a view to getting a better understanding between the two societies and to recommend that a veterinarian be appointed as chief inspector in Toronto, and if possible in other cities. Also that a prominent member of the O. H. S. and Dyce Saunders, K. C., be invited to the next regular meeting to address the Association to make clear to the members the laws relating to the O. H. S.

T. B. Buckley then announced that he would move at the next regular meeting that "In future the election of officers shall take place on the evening of the first day of the regular meeting, and that no man shall be nominated unless he is present. Also that a member of the executive committee automatically drops out of the committee if he is not a regular attendant at executive meetings."

Court J. Spencer, of Dundee, N. Y., gave a talk on "Practical Hints on Surgical Restraint and Technique." He illustrated his address by showing on model stocks useful methods of shoeing vicious horses, dehorning cattle, restraining hogs, etc.

J. Dunn, of Barrie, next addressed the meeting on "Surgery in Poultry Practice." He gave the treatment for fractures, impaction of the crop and wounds. Caponizing was also thoroughly discussed.

This paper was followed by one on "Differential Diagnosis of Diseases of Poultry," by W. A. Thompson of Washago. In this paper Dr. Thompson gave an outline showing the most

characteristic symptoms of certain common but important poultry diseases. It is hoped to publish this helpful paper in the C. V. R.

Mr. McCallum of the Horse Division, Department of Agriculture, was next called upon to speak. He stated that veterinarians could do great work in connection with this division in the improvement of horses in Canada. He strongly urged the veterinary profession to discourage the breeding of poor quality horses.

At the beginning of the afternoon session a demonstration in caponizing was given by J. Dunn, who has had cosiderable experience in this work. Each step of the operation was thoroughly described to an interested group of spectators.

"The Horse, Canada's Cheapest Farm Power," was the address delivered by Wayne Dinsmore, Secretary, Horse Association of America. In calling for a more wide appreciation of the usefulness of the horse, not only on the farms, but by people generally, the speaker went on record as declaring that not only was the horse more efficient than the tractor on small farms, but last-minute experience had indicated that on the bigger farms and ranches horses were more useful and efficient than tractors. Mr. Dinsmore made a plea for the more general use of the horse in place of the motor car, pointing out that horseback riding was one of the most healthful of exercises.

The session concluded with a demonstration in the treatment of sterility in a cow by J. N. Pringle, of Toronto. Examination per rectum revealed one normal and one cystic ovary. An equine clinic had been arranged by W. J. R. Fowler and T. B. Buckley of Toronto, but owing to the lack of time this unfortunately had to be abandoned.

During the meeting arrangements were made for visitors to see through the abattoir, guides being provided by the Health of Animals Branch.

Owing to lack of space and the fact that the copy has to be rushed to the printers, this report is necessarily very brief. Thanks are extended to all who helped to make the meeting a success, including those who took part in the program and discussions, the exhibitors of biologics, pharmaceuticals and instruments, Dr. Brind, Inspector-in-Charge, Harris abattoir, the Motion Picture Bureau, and the Harris abattoir for their kindness in providing their recreation room, cafeteria and cigars.

J. S. GLOVER, *Secretary.*

MISSISSIPPI VALLEY DIVISION OF BUREAU VETERINARIANS

A special meeting of the Mississippi Valley Division N. A. B. A. I. V. was held at the Federal Building, East St. Louis, September 18, 1922. A round-table program was in order, President Dr. C. T. Snyder presiding. Drs. J. W. Joss and J. S. Jenison reported the activities of the N. A. B. A. I. V. meeting held at St. Louis, August, 1922.

A lively discussion followed, relative to the next meeting place at Chicago, December, 1923, with the U. S. Live Stock Sanitary Association, the efficiency examining board and the intended drive for a majority membership and the Retirement Act.

It was thought advisable to appoint a committee to draw up resolutions and present at next meeting of the National Association to amend the By-Laws to read per capita tax one dollar per annum.

Dr. Bruns was appointed special solicitor. Dr. Jenison, Vice President at large, has promised lively news letters at regular intervals.

All Bureau veterinarians are requested to attend the next meeting November 14, Public Library, St. Louis, for another round-table discussion. O. E. BARTH, *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. Robert S. MacKellar, in the New York State Veterinary College building, 331 East 26th Street, on June 7, at 8.30 p. m. The minutes of the May meeting were read and approved.

Dr. Charles H. Higgins entertained the members with an interesting talk on "Glandular Extracts in Veterinary Practice." Dr. Higgins has had extensive experience in laboratory work and in watching the results in practice. He is convinced that the glandular products should have an important place in the treatment of animals and especially so to men engaged in canine practice. A lively discussion followed Dr. Higgins' discourse.

Dr. Slawson said he used a number of the glandular extracts

with good results. Dr. Rohar gives pituitary extract in retained placenta in bitches and cats.

Dr. Gannett said he had two cases of dystokia in cats lately. He gave 1 c.c. pituitin with satisfactory results. Dr. Kock and others joined in the discussion.

Dr. Alexander Slawson read an instructive paper on "Miliary Tuberculosis in Dogs." In the doctor's opinion this disease is quite common in house dogs. They contract it from the people with whom they live. He showed the photograph of an English bull terrier, 3 years old. The doctor was called to examine him after the dog had a long swim, when he showed severe dyspnea and extreme exhaustion. The doctor was called to examine him again 5 weeks later and found him emaciated, dull, listless and with pendulant abdomen. Diagnosis: tuberculosis. He was destroyed and a postmortem held which showed generalized miliary tuberculosis. A section of the peritoneum showing a generalized infection was exhibited. In the discussion which followed Dr. Bruce Blair said he diagnosed three cases of tuberculosis in dogs, verified by postmortem. These cases all came from families in which some of the members suffered from this disease.

Dr. Gannett reported on two Boston terriers which he attended, both being infected with tuberculosis. These dogs slept in the bed with a woman who had the disease.

Dr. Ackerman reported a case of spontaneous recovery of rabies in a dog.

A telegram was read announcing the marriage of Dr. O. E. McKim to Miss Jene Bruce, giving his future residence as 3438 Filbert Street, Philadelphia. It was moved that a night letter of congratulations from this association be sent to Dr. McKim, which was seconded and carried.

The President appointed Drs. Gannett, Slawson and Bruce Blair as delegates to the New York State Veterinary Society Convention and Dr. Reid Blair as delegate to the A. V. M. A. Convention.

The Secretary read a letter from Dr. Herman Stark, asking the association to accept his resignation as a member. It was regularly moved, seconded and carried that Dr. Stark's resignation be accepted.

No further business appearing, the meeting adjourned.

J. ELLIOTT CRAWFORD, *Secretary.*

COMMUNICATIONS

VETERINARY CONDITIONS IN NORWAY AND SWEDEN

To the Editor:—

This is my promised letter giving you what few scraps of information I have gleaned on my trip. I sailed for Norway on August 1 and went to Christiania via Bergen. At Christiania I met Professor Halth of the Veterinary Institute, who is a most active, progressive man; he keeps closely in touch with American work and takes our Journal. Though he does not talk English very well, I learned the following facts from him:

Swamp Fever.—They have had about 70 cases; the infection came from Sweden. All cases have occurred along the border. Prof. Halth believes in slaughter, and has killed 30 cases this summer. The animals die in summer and fall. A few live into the winter; some recover and are carriers. Diagnosis very difficult; history of importation helpful. Halth has noticed increase in lymphocytes and diminution of eosinophiles. He believes that insects carry the disease, as it is a summer disease and does not occur at high altitudes.

Rouget.—Plenty of rouget exists in the country. This is also a summer disease. Rouget serum made from horses is used; 50 c.c. is the dose for an adult pig; 90 to 95 per cent recovery after treatment.

Hog Cholera.—Rare outbreaks occur; only 2 or 3 last year. Origin of outbreaks impossible to trace.

Glanders.—Very rare. Subcutaneous test is used on all imported horses.

Foot-and-Mouth Disease has been kept out of the country. The disease comes from Denmark into Sweden. It is believed that the infection is nearly always brought in by cattle buyers. Authorities do not believe that birds play any part in carrying contagion.

Strangles serum is used extensively and most successfully. It is made at the Institute. They use Schütz streptococcus, and if possible obtain strains of organisms from the different outbreaks.

Tetanus serum is also produced at the Institute.

Tuberculin is made from a mixture of bovine and human strains in 200 c.c. flasks. They are working on a rabbit test for their tuberculin, much after Schroeder's test on guinea-pigs, but they seem to rely on cutaneous reactions on the injected rabbits.

Prof. Halth works diligently and only had one assistant, two girls and a laboratory man on the premises.

There are district veterinarians. Where there is no local practitioner, as in Alten district where I am at present, the Government veterinarian attends to all cases. However, as the distances are very great the veterinary often arrives too late to help the animals.

Stockholm Veterinary School.—This is the finest veterinary school I have ever seen. I did not have time to go over all the buildings, but they are large, well lighted, and the class-rooms excellent. The bacteriological department seems the most active department. Prof. Gergman was away in Germany when I called. Prof. Dahlstrom, the head of the college, helped me very much on my reindeer work. They only have a hundred students at the school. Prof. Dahlstrom is much interested in the Swedish Society for the Prevention of Cruelty to Animals, and has invented a humane killer. He is strongly against the practice of pithing, and is trying to stop the practice amongst the Lapps. In my recent paper on the Alaska reindeer industry I spoke in favor of pithing, as it is quite easy to run a knife through the medulla and into the brain at one thrust. I explained this to Prof. Dahlstrom and he argued that if this was so, he had no objection to offer. Tuberculin testing is going on in Sweden and Norway, but as far as I can learn they are conservative about killing. When there are udder lesions present they kill and pay compensation.

Prof. Dahlstrom made a trip into Russia last year to look into the cattle plague situation. Apparently he is satisfied that there is no danger of its invading Scandinavia. Prof. Dahlstrom is very anxious to visit America.

In Norway Dr. Jensen's influence (Copenhagen) is strong and many Norwegian veterinarians are graduates of his school. I have little to add except to say that I am interested in my trip.

Getting near the reindeer is difficult at this time of the

year as the deer are so high up in the mountains. The climbing is hard, as there are so many rock slides to cross. There have been no serious epizootics among the reindeer for several years. The last one was some form of lung trouble at Christiania. They thought it was due to a Pasteurella, but they told me that the specimens reached them in glycerin and that their cultures were not very successful.

SEYMOUR HADWEN.

Bosekop (Alten), Norway, Sept. 3, 1922.

MORE ABOUT THE HORSE ENDURANCE TEST

TO THE EDITOR:—

The Breeders' Gazette of Chicago in its issue of August 31, on page 235, has a three-column article by Wm. W. Dinsmore, Secretary, Horse Association of America, on our recent 300-mile endurance test. He did not tell all about it, though. He should have said that the judges were Major Henry Leonard of Washington, D. C., and Colorado Springs, Mr. D. Byrant Turner, Colorado Springs, and Major G. E. Cullum of Washington, D. C., who is Chief of the Remount Department of the U. S. Army. They were the most efficient and impartial men with whom the writer ever was connected. There were also three veterinarians, Dr. M. J. Dunleavy of Denver, Lieut. B. C. Bridges, Army Veterinary Corps, from Fort Reno, Okla., and the writer, and all were "on the job" from start to finish. The State Humane Society, too, was well represented and also well pleased.

Another thing Mr. Dinsmore did not emphasize was that the more purebred blood coursing in the animal's veins the better able he was to stand the test.

There were very many interesting details to this test, but they are too numerous to write about, besides they might not interest readers at a distance.

Please let the veterinarians of the country know that horses are still able to cover "the distance," especially since a large number of the younger men scarcely believe a horse can "get anywhere."

A. J. SAVAGE,

Colorado Springs, Colo.

NECROLOGY

Lowery Laymon Lewis, dean of the faculty of Oklahoma A. and M. College, died at his home in Stillwater September 26, following an illness of several months.

Dr. Lewis was the oldest member of the college faculty in point of service. He went to Stillwater in 1896 as professor of veterinary medicine and as State Veterinarian. In 1899 he became professor of zoology and experiment station bacteriologist. In 1900 he was made dean of the school of veterinary medicine; in 1914 of the school of science and literature, and in 1921 dean of the faculty, a position created for him.

At the time of his death he also held titles of professor of veterinary medicine, professor of zoology, experiment station bacteriologist and veterinarian.

He was acting president of Oklahoma A. and M. College nearly a year, between the administrations of J. H. Connell and J. W. Cantwell, in 1914-15. He was born near Newport, Tenn., September 3, 1869, moving to Texas when ten years old.

In 1893 he received the degree of bachelor of science in agriculture at Texas Agricultural and Mechanical College, College Station. Later in the same year he took his master of science degree there. In 1894 he took a doctor of veterinary medicine degree at Iowa State College, Ames. Lewis was recognized as the father of athletics at Oklahoma A. and M. College. Lewis Field, the scene of varsity athletics, was named in his honor nearly twenty years ago. For many years he was chairman of the athletic council. Among the alumni of the college Lewis was known as "Doc Lew."

In later years, old timers of the alumni and former students have returned to Stillwater to visit him. He was the only man on the campus whom they had known when in college. Last spring the alumni corporation started plans to erect a memorial of some sort to him. It was desired to build it before his death. The committee appointed to get suggestions relative to it and to provide ways and means for it has not completed its work.

About five years ago Lewis suffered a stroke of paralysis, from which he recovered and resumed his work at the college. Several months ago, while returning to Stillwater from a trip

to Texas, he was taken suddenly ill, and for many weeks was at the point of death. His condition improved until he was able to ride about town, but was unable to go to his office. Recently he became weaker.

Dr. Lewis is survived by his widow, a son and a daughter.

Doctor R. A. Branson, of Cottonwood Falls, Kansas, died at a hospital in Topeka, Kansas, on August 28, following an operation for appendicitis.

Doctor Branson was a graduate of the Kansas State Agricultural College, Veterinary Division, in the class of 1911. He joined the A. V. M. A. in 1915.

James Breckenridge Paige, formerly head of the department of veterinary science at Massachusetts Agricultural College, died suddenly October 5, 1922, at the sanitarium in Waverly after a long illness. Dr. Paige was widely known in Western Massachusetts, where his many activities brought him in contact with all classes of people. He performed notable service for the college and for the community, bringing to its accomplishment keen intelligence, sound training, courage, the will to perform. Sincere in his friendships, those who knew him trusted him implicitly, a trust that never was betrayed. Whatever of distinction was gained by the veterinary department at the college was mainly due to Dr. Paige. It was largely through his exertions and influence that the Legislature made appropriations for the veterinary laboratory and stables on the college grounds. For years he served as veterinarian to the State Board of Agriculture. In matters pertaining to his profession he was a recognized authority.

He was born in Prescott in 1861, the son of Francis B. Paige. He was graduated from the Massachusetts Agricultural College in 1882, and in 1888 from McGill University, with the degree of doctor of veterinary science. After practicing his profession in Northampton three years he was appointed a professor at the Massachusetts Agricultural College, where he organized the department of veterinary science. He later engaged in graduate study at McGill University and at Munich, Germany. A republican in politics, he represented the district in the Legislature in 1902 and 1903. He served as a member and clerk of the committee on agriculture, and a member of

the committee on public health. Had he chosen to remain in politics he might readily have gained nomination and election to the Senate. He was a member of Pacific Lodge, A. F. & A. M., serving as Worshipful Master. He served also as Past District Deputy of the 17th Masonic District, as a trustee of the Masonic Home at Charlton, and was a member of the Royal Arch Chapter and higher bodies in Masonry. For several years he was secretary of the General Association of the Alumni of M. A. C. He was a member of the Amherst Club, and served as its president. He married, in Bondsville, December 28, 1885, Ada Russell, daughter of Richard Russell, who survives him, with one daughter, Beryl Paige, now studying for M. D. degree at Columbia University. He also leaves two brothers, Dr. Henry E. Paige, of Amherst, and Frank E. Paige, of Brookline. Dr. Paige was a good citizen, a good neighbor, a dependable friend. Those who knew him best feel sincerest sorrow in his passing.

Antirabic treatment was administered to 998 persons at the Pasteur Institute, Paris, during 1921, with only one death.

A French scientific commission for the study of cancer, appointed by the Minister of Hygiene and headed by Dr. Roux, director of the Pasteur Institute, has among its members two veterinarians, Professors Cadiot and Petit of Alfort.

A leading article on "Selection as a Method of Improvement of Domestic Animals," by Prof. J. L. Frateur, Director of the Institute of Zootechny of Louvain, in a recent number of the Belgian veterinary journal *Annales de Médecine Vétérinaire*, shows that our Belgian confrères are alive to the importance of the veterinarian having a good knowledge of animal breeding.

A German medical commission which was appointed in 1920 to select German terms to replace French and English terms used in German medical literature has made its report giving a list of new expressions proposed as substitutes for the old. The list as published in the *Deutsche Medizinische Wochenschrift* and the *Münchener Medizinische Wochenschrift* contains more than fifty terms.

MISCELLANEOUS

PACKERS INDUCED TO PAY BETTER PRICES FOR REACTORS

In the campaign for the eradication of tuberculosis in cattle being carried on by the United States Department of Agriculture, the States, and counties, one of the most important economic considerations is the salvage, at a fair price, of the animals that react to the test. Up to a year and a half ago a large percentage of the reactors that were passed by the inspectors as perfectly fit for food did not bring a fair price, because some buyers took an unfair advantage of the seller and profited unreasonably.

The Department of Agriculture through the Bureau of Animal Industry and the Packers and Stockyards Administration has been looking into this matter for a year or more, taking it up with packing concerns, commission men, and organizations interested in the marketing of livestock. As a result much better prices are now being paid. Reports to the Department show that the prices being paid for such cattle in various parts of the country are getting very close to the prices paid for the same class of cattle on the regular market. A special traveling inspector now spends all his time visiting livestock markets, noting prices that are being paid for reactors and insisting that buyers who are discriminating against them pay a fair price.

Carcasses of reactors that have been passed by the Federal inspectors are worth as much and are as wholesome as any other carcasses. There is no warrant for price discrimination against them. Many of the leading packers at the big markets and a large number of the smaller concerns on many markets now see the justice of this view, with the result that reactors are now selling at more nearly fair prices.

The department has compiled figures on the prices received for reactors in a number of States for 1921 and 1922, and in several of them the increase in average price has been considerable, in a few instances reaching more than 100 per cent. In Kansas the average price paid for these cattle rose from $16.52 to $34.26; in Minnesota from $17.74 to $24.48; in Missouri from $15.60 to $31.93; in Wisconsin from $16.09 to $26.25, and in

Vermont, where only one firm had been handling them previously, from $5.61 to $16.29. In 18 States, including the livestock and dairy States of the Middle West and a number of Eastern States, the average price paid increased about $3.00 a head. The department expects that continued efforts on the part of the bureau and the Packers and Stockyards Administration will result in still better prices for reactors.

Packers, commission men, and livestock exchanges are getting behind the movement for better prices since they have been impressed with the fact that the encouragement of the work of tuberculosis eradication means more and better business in the future. The Institute of American Meat Packers passed a resolution calling upon the members to pay as much for reactors as for untested cattle of the same quality.

In connection with this discussion of prices, it is well to keep in mind that the area method of eradicating the disease has an additional advantage in that more reactors are available from one place at one time and, consequently, can be shipped at less expense and can be handled more economically at the yards and in the packing house.

FOOT AND MOUTH DISEASE IN JAMAICA

Reference was made on page 131 of the October number of THE JOURNAL to "A Suspicious Disease in Jamaica." Immediately on receipt of information concerning the character of the symptoms and lesions of the disease as given in the report of the Veterinary Consultant of the Jamaica Agricultural Department to the Colonial Secretary, the United States Bureau of Animal Industry on August 16 issued instructions as a protection to our livestock industry, debarring Jamaica hides, skins, etc., from entering the United States. That the suspicions of the Bureau were well founded is revealed in the information contained in the following article which appeared in the September 19 issue of *The Daily Gleaner*, published in Kingston, Jamaica. It seems from the letter of September 11, quoted in the article, that early in his observation of the disease the Veterinary Consultant was fully convinced of its nature, but suppressed such diagnosis from motives which are apparent in this letter.

CATTLE DISEASE NOW DIAGNOSED "FOOT AND MOUTH."—GOVERNMENT VETERINARY MAKES STATEMENT CONCERNING TRUE NATURE OF OUTBREAK IN THE WEST.—ACTION EXPLAINED.—HEAVY RAINS IN PARISHES HAVE CAUSED DISEASE TO TAKE SEVERE FORM.

Through the courtesy of the Acting Colonial Secretary, *The Gleaner* publishes the following copy of a Government notice relating to the outbreak of disease among cattle in the western parishes, which has been diagnosed as "'Foot and Mouth Disease."

Colonial Secretary's Office,
18th September, 1922.

Referring to Government Notice No. 409, dated the 25th of July last, declaring Calf Diphtheria (Necrotic Stomatitis) to be a contagious or infectious disease within the meaning of the Contagious Diseases Animals (Inland) Law, 1909 (Law 1 of 1909), it is hereby notified for general information that the disease has now been diagnosed by the Government Veterinary Consultant as Foot and Mouth Disease under that Law.

The following report of the Government Veterinary Consultant dated the 11th of September, 1922, addressed to the Acting Director of Agriculture, is published for general information.

(Sgd.) D. H. HALL,
Acting Colonial Secretary.

THE REPORT

"Merton," Halfway Tree,
September 11, 1922.

To Acting Director of Agriculture,
Hope.

Sir: I have the honor to submit my fifth interim report on the cattle disease in the western parishes.

I left Kingston the 7th instant, and proceeded to Sav-la-Mar.

In the majority of cases where there have been heavy losses there has been evidence of excessive handling and harassing of cattle such as driving far distances to the pen, catching and throwing animals down in order to rub their mouths with salt, Seville oranges, etc.

Having regard to the occurrence of the severe form of the disease on properties which I had anticipated would have only the mild form; the difficulty of securing efficient quarantine with range cattle; the question of the exportation of hides, a contingency which I did not foresee, I desire to make a statement concerning the true nature of the outbreak in the western parishes and at the same time to give an explanation of my attitude in regard to it.

On my first visit to the Montpelier area on July 18th, I observed symptoms among the affected cattle which filled me with grave fears as to the nature of the disease. Wishing to prevent, if possible, the spread of the disease should my suspicions be correct, and at the same time to minimize a threatened panic among the penkeepers, I telegraphed to you that the disease, which I termed "Necrotic Stomatitis and Coronitis," should be immediately scheduled under the Contagious Diseases Animals (Inland) Law 1 of 1909.

The remainder of my time was occupied to discover the limit of spread of the disease and to devising methods of treating range cattle under the prevailing conditions.

On my following visit July 24th, my suspicious were fully confirmed that the disease was "Foot and Mouth" disease. By this time, however, its spread was found to extend over a much wider area than was at first supposed, involving the three parishes.

"Necrotic Stomatitis and Coronitis" had already been declared a contagious disease and quarantine measures were being enforced.

As it seemed that the method of stamping out the disease by slaughter was impracticable, and, because all outbreaks outside the original infected area gave every indication of running a very mild course, I hope to be able to arrest the disease by means of quarantine and decided to withhold my opinion.

About this time heavy rains began to fall over the original infected area and surrounding hills which adversely affected many animals.

Since this time rains have been experienced almost daily. Many properties which I anticipated would have a mild form of the disease have recently been experiencing the severe form.

For this reason as well as to prevent the exportation of hides with the risk of infection to other countries I have decided to disclose the true nature of the disease which, as stated above, I had hoped to arrest at as low a cost as possible and without causing great panic.

It is my particular desire that this portion of my report should be given full publicity, as I am unwilling that any blame should be attached to your or any other department.

I have the honor, etc.,

(Sgd.) G. O. RUSHIE GREY,
Govt. Vety. Consultant.

The veterinary school at Alfort, France, closed its session last summer with 205 students, including a graduating class of 76.

The Washington *Star*, telling of the efficacy of Dr. Maurice C. Hall's carbon tetrachlorid treatment for hookworms, says: "A single dose removed all of the parasites from 90 per cent of 12,000 patients treated in the Fiji Islands." Pretty good for one dose!

At a recent meeting of the Lewisham Division of the British Medical Association, Prof. Frederick Hobday, a distinguished British veterinarian, presented a paper on "The Necessity for Cooperation of the Medical and Veterinary Professions in the Control and Eradication of Diseases Intercommunicable between Man and Animals."

In the Belgian Congo bananas are regarded as a good food for livestock, according to L. Pynaert in the *Bulletin Agricole du Congo Belge*. As a general rule bananas are fed to animals only when there is a surplus of the fruit. The fruit is fed in two forms—the peelings, and the dried fruit as a flour or meal. The peelings are rich in protein and fat, and the flesh of the fruit has a high content of carbohydrates.

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DUTIES OF COUNTY AGENTS LIMITED

SECRETARY WALLACE issued a statement in the September 6 issue of *The Official Record* concerning the relation of Federal cooperative employees to agricultureal organizations. After quoting section 2 of the act of Congress approved May 8, 1914, the Secretary says:

"It is thus made clear that the work of the cooperative extension employees, whether county agents, home demonstration agents, boys' and girls' club agents, or other cooperative extension workers, is educational. These extension workers are public teachers, paid with money largely raised from all of the people by taxation, and are charged with giving instruction and practical demonstrations in agriculture and home economics. Their work covers the entire rural field, which includes economic production, economic marketing, and the development of better home, community, and social conditions.

"As they are public teachers, it is not a part of the official duties of extension agents to perform for individual farmers or for organizations the actual operations of production, marketing, or the various activities necessary to the proper conduct of business or social organizations. They may not properly act as organizers for farmers' associations; conduct membership cam-

paigns; solicit membership; edit organization publications; manage cooperative business enterprises; engage in commercial activities; act as financial or business agents, nor take part in any of the work of farmers' organizations, or of an individual farmer, which is outside of their duties as defined by the law and by the approved projects governing their work. They are expected, however, to make available to organizations such information as will be helpful to them and contribute to the success of their work."

In referring to the Secretary's statement, *The Pacific Dairy Review* for October 5 says in an editorial:

"The Secretary of Agriculture, we are convinced, has done a wise thing at the right time in issuing a ruling under which the duties of county farm agents are more clearly defined. We say it is wise because we believe it is in the interest of the system. That the original purpose of the law and the appropriations to carry it out was purely educational there is no doubt whatever * * *. The farm bureau agents have from the start been under the fire of reactionary interests that do business with the farmers and the ruling of the Secretary of Agriculture is opportune in settling a serious complication and we have no doubt but that it will be especially welcomed by the county agents themselves."

Implement & Tractor Trade Journal for September 23 says in an editorial:

"At last the work of the 'county agent' has been officially defined! In issuing his statement of definition Secretary Wallace virtually issues an order commanding all agents to desist from those activities in which they have no proper business and which, in one way or another, have created dissatisfaction with the enterprise of the farm bureaus on the part of farmers themselves, the mercantile community and citizens at large. In his official definition Secretary Wallace declares the county agent's duties to be essentially 'educational.' The head of the department is right, of course."

Here and there county agents have conceived it to be their duty, and in some instances they have been urged or it has been demanded of them, to help farmers buy and sell their supplies and products cooperatively and perform other commercial services which do not properly belong to them. It would seem

that the habitual immunization of hogs against hog cholera and otherwise treating animals for various ailments also come under the ban. Such services cannot be regarded as "educational" duties or "practical demonstrations in agriculture and home economics." They cannot be regarded otherwise than as commercial services.

BOTULISM IN SCOTLAND

ACCORDING to the British press of August last, quite a tragedy occurred at the Loch Maree Hotel in one of the northwestern counties of Scotland, as the result of botulism, which caused the deaths of five guests and a servant, who were members of a picnic party, the organism having evidently occurred in meat-paste sandwiches which the victims had partaken of.

In an interview given by Dr. J. C. Ledingham, chief bacteriologist of the Lister Institute, London, who confirmed the diagnosis, he stated, which to us seems rather remarkable, that "we have not had a case of botulism in human beings reported in Great Britain before to my knowledge, although there have been many cases in America," etc.

The doctor further stated that botulism among horses had been very prevalent in the north of Scotland, and had caused the deaths of many animals during the previous few months, although that, of course could have had nothing to do with the Loch Maree outbreak, the cause in the horses evidently being infected forage.

Touching the term "ptomaine," Dr. Ledingham suggested that it ought to be abolished, as it meant nothing; and that the great majority of so-called ptomaine cases were bacterial in origin, and not due to any chemical product of putrefaction.

There were two points in the published reports in connection with the outbreak which attracted our attention, viz., the evident scarcity, up to the present at least, of botulism in human beings in Great Britain; and the rather extensive outbreak among horses in the north of Scotland, as we had not previously seen any account of the latter in the British veterinary press, which would probably suggest that botulism in horses is also rarer over there than it is with us in the United States.

W. H. D.

CONSISTENCY, THOU ART A JEWEL

WE NOTICE, with considerable surprise, that a number of our prominent members of the profession, few, if any, of whom, however, are dependent upon practice for a living, have contributed articles on animal diseases to a popular work for farmers and stockmen which is published by one of our great department stores.

In extenuation it may be said, of course, that if they had not written such articles, others would; and that it was better to have them correct and up to date than to have them contributed by those who were not so well posted. We can not get ourselves to believe that that is a sufficient excuse, from an ethical standpoint, as we are of the opinion that such information might be made to reach the public through a more ethical channel than a department store publication, the sole object of which is to increase the sales of the merchandise handled, including the publication mentioned, and certainly not the advancement of the veterinary profession from a scientific point of view.

It is evident that some of the leaders of the profession must "grade" their ethics, and adapt the grades to circumstances, whatever the latter may be. However, one of the "grades," which we can not quite comprehend, is, when men at the head of veterinary institutions, who are presumed to graduate men to make their living by their practice, can circumvent the prospects of the latter by contributing articles on animal diseases to a work published by a commercial concern, which is likely to get into the homes of the great majority of the stock owners of the country. It seems paradoxical, to say the least; but, like "postum," there may be a reason. It seems so hard to be consistent. At the same time, "Consistency, thou art a jewel."

NOBLESSE OBLIGE.

VICTORY FOR FOREIGN DRUGS

IN THE HASTE of last-hour legislation, and particularly through the compromise on drugs and dyes made by the congressional conferees on the tariff bill, American organic chemical industry is faced with a discouraging situation. The earnest work of the last six years to make the United States self-sufficient in the matter of synthetic drugs and necessarily the interdependent dyes, the concomitant enthusiasm for the chemical profession stimulated in our universities, and a large amount

of capital invested in plants, are about to be sacrificed. The prewar condition of foreign domination of our materia medica is imminent, a period when it seemed that any product which could not be used as a dye was quickly added to the increasing list of synthetic drugs. Thanks to American control, physicians no longer are being flooded with advertisements of new unessential synthetics, while the really valuable drugs are being made in this country in adequate quantities; the drugs are pure and the prices are fair. Under the legislation just passed, the drugs and dyes derived directly from coal tar received some protection—though inadequate—based on American valuation. On the other hand, the synthetic chemicals of non-coal tar genesis (about 30 per cent of all organic chemicals), including many valuable drugs, received no practical protection; they may be imported on a 25 per cent duty based on foreign valuation. Furthermore, it is stated that large stocks of dyes and medicinals taken in lieu of reparations, costing relatively little, are held in England, France, Belgium and Italy. Yet these countries are protecting their own industries by embargo or measures similar to the recently terminated license import system of this country. It is asserted that this enormous surplus material will be shipped immediately to the American market. Development of the next few weeks will be watched with anxiety by those interested in organic chemistry in the United States; and if the predicted dumping of these products from Europe on the American market actually does occur, a renewed effort should be made at the December session of Congress to protect the basic key industry so necessary for the conservation of health as well as national security.—*Editorial in the Jour. Amer. Med. Assn., Sept.* 30, 1922.

AGAINST LIFE-SAVING

(From *The Outlook,* October 25, 1922)

COPIES have been sent us of so-called antivivisection bills introduced in Colorado and California; we are told that in the latter State an attempt is to be made to secure indorsement from the voters at the coming election. We strongly urge any voters before whom the question may come to refuse to indorse the measure. Certainly they should not do so unless they know just what it means.

The California bill bears the misleading caption, "An act

prohibiting the vivisection or torture of human beings or animals." But in the text we find that "the causing of any deformity, *sickness,* or disease in or to any living creature for experimental purpose" is punishable. Now, it may be wrong to give a mouse a new drug or inject in him a new serum, but it certainly is not "vivisection or torture" unless it is "vivisection" to inject the new diabetes serum in a human patient or "torture" to give him a dose of calomel. The major part of the antivivisection argument is based on the horror caused by the sound of the word vivisection, although the thing sought to be restrained is not torture but mild experimentation from which (as has been demonstrated beyond question) both the human and the animal world have benefited enormously.

The present California law allows "properly conducted scientific experiments or investigations performed under the authority of the faculty of a regularly incorporated medical college or university of this State." The new bill repeals this provision, and thereby brands all the State's colleges and medical schools as cruel. Could fanaticism further go! An attempt is made to get the trapper and farmer vote by allowing amateur barnyard operations and ignoring the suffering or starving of tortured trapped animals.

The Colorado bill has a mild title referring to "experimental operations or administrations"; but the text defines among the things included anything which may "cause pain or suffering in any part or any organ"—a wide-open definition.

A refreshing contrast to these bills comes to us simultaneously. It is a resolution passed by a vote of about 600 to 20 by the Pennsylvania State Federation of Women putting on record "their gratitude to medical science for past discoveries so profoundly beneficial to human beings and to animals, and we believe that such beneficent researches should be continued and encouraged."

A valued correspondent calls attention to the benefit of animal experimentation in saving animals from death and suffering and in food values. Thus in six years through the use of a serum discovered by animal experimentation the loss from hog cholera was cut down by about $47,000,000. The illustration might be multiplied.

If there is any real cruelty or malicious torture going on, by all means let it be stopped. But don't be misled by hysterical language.

THE VETERINARY CURRICULUM[1]

By VERANUS A. MOORE

Dean, New York State Veterinary College at Cornell University, Ithaca, N. Y.

FOR MANY YEARS this association struggled to raise the entrance requirements for recognized veterinary colleges to a reasonable standard. There were then two clearly defined groups among veterinarians on that subject. One, knowing what the practitioners had done and still were doing, was content to have progress checked and practice continue as it was. The other recognized that we were in the midst of a constant discovery of facts and new truths that could be understood and applied only by educated and trained minds. These latter insisted on a preliminary education sufficient to enable a student to understand the sciences on which the art of veterinary medicine rests. The outcome was the declaration by the association, and later by the Government, that four years of high school, or its equivalent in academic work, was the minimum preparation for matriculation. The colleges that could not require it have closed their doors.

In like manner the length of the course of study was slowly and grudgingly extended from two sessions of five months each to four full academic years. The methods of teaching also have changed. At first the full curriculum was given each year, as in human medicine, and after a student had repeated it he could take the examination and graduate. At present the course is graded and the subjects are taken in what to the teacher seems to be a logical sequence.

Today our colleges are confronted with educational problems more difficult to solve than the raising of the entrance requirements and the lengthening of the course of study. In fact, the prerequisites may have to be reconsidered and the time devoted to the curriculum extended before a satisfactory solution is obtained. Fortunately there are no longer opposing groups of men, each seeking a different verdict. We are unanimous in the belief that the curricula that are to be followed

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

should be those that will best prepare our students to meet the ever-increasing and exacting demands on the veterinarian.

Our veterinary colleges are no longer schools to prepare men to diagnose and treat the ills of individual animals alone, but rather institutions where not only instruction in animal diseases and their treatment is developed highly but also where animal hygiene and sanitation, animal husbandry, dairy and meat inspection and the relation of animal diseases to public health are given proper consideration. The veterinarian must cease to be merely a doctor, a "tinker" of sick and injured animals. He must become the leader in the animal husbandry of his community and the protector of the human family from the diseases of animals communicable to man. His services are needed constantly by the livestock owners to solve the problems in breeding and feeding to the end that the losses from disease may be lessened.

Those of us who are charged with the responsibility of directing veterinary education feel that the curricula now followed do not meet fully the obligations of the schools either to the profession or to the animal owners. We are all too often disappointed in the degree of success attained by young graduates whom we believed to be capable, qualified and enthusiastic in their work. Again, we are often told by those who have followed the prescribed course and have gone into the practice of their profession that they do not find themselves as well prepared for their duties as they should be. Further, animal owners not infrequently make the observation that the recently graduated veterinarians are not as well disciplined in the principles underlying their work as they had expected to find them. These rumblings, suggestive of imperfection, are signals that should be heeded. They do not indicate necessarily that there is violation of any fundamental principle in pedagogy, but that readjustments are called for. The profession occupies a more important position in the eyes of the public than at any previous time. It is operating under different conditions than heretofore, and, consequently, changes of procedure are required to articulate it with the varied interests served.

At the present time the veterinary profession is in a somewhat critical state. The growth of knowledge in animal husbandry and agriculture generally has been quite as rapid as it has been in medical lines. The public has a better understand-

ing of the symptom-complex of disease, its cause, prevention and treatment, than heretofore. For that reason the wealth of new knowledge in the basic sciences and the more thorough courses in veterinary colleges have not given veterinarians much actual advancement over the time when both they and the public were less informed. Nevertheless, the opportunities for veterinarians to establish points of contact with animal husbandry on one side and public sanitation on the other are greater because of a keener appreciation of the helpfulness of one to the other. This does not lessen the obligations of the schools. They must teach the subjects necessary to qualify their graduates to do efficiently their professional tasks and to satisfy the owners that they have been done properly. The efforts of the practitioner are being judged by a public far better qualified to pass on the character of his work than it was before the advent of agricultural colleges. The employers of veterinarians are often thorough students of breeding, feeding, hygiene, or the principles of preventive medicine, and therefore intelligent judges of the work of the practitioner. In these circumstances the securing of a training broad enough in its range of subjects and thorough enough in the details of each to meet the present-day demands is a difficult task to be accomplished in a four-year curriculum with only a high-school preparation.

In trying to analyze the subject I soon found that it was not a matter for a single person or school to adjust. The importance just at this time of being secure in the educational part of our profession convinced me, perhaps without sufficient evidence, that the curriculum was the cornerstone of veterinary service. I was so deeply impressed with the necessity of ascertaining if our courses of study conformed to the progress that is being made in animal husbandry and sanitation that I decided to bring the subject before this section for analysis, and I hope constructive criticism. In the forward movement of veterinary education and service the curriculum seems to be the first factor for each of us to deal with. In this connection I am assuming that the teachers possess a full measure of knowledge, that the students have been prepared properly and have lofty ideals, and that adequate facilities are provided. Each of these is an integral part of the composite of college training.

and if one is missing, the true value of the others can not be determined.

The preliminary education of the student has much to do with the success of a curriculum. Many of the failures on the part of graduates are traceable not to the course of study in the professional school, but to the lack of preliminary training and discipline. The character of the teaching the boy has had determines to a large degree his ability to profit by the instruction in technical schools. It is essential for the student to have a good general education as a background for his special training. However, we must be careful in adjusting a course of professional studies not to expect more than can arrive through the approach provided. There is an eternal "fitness of things" that can not be removed and which always should be taken into account. The good preparatory schools, as President Hadley said of liberal arts colleges, are institutions "where students learn things that they are not going to use in future life by methods that they are going to use. The former element gives the breadth, the latter element the training." I believe it is the mental training that comes through good and inspiring teachers rather than the subjects taught that prepares the boy for the serious study of medicine.

The curricula that are being followed in the veterinary colleges are the products of a long evolution of ideas of what an efficient veterinary course should be. Each faculty has tried to make its course comprehensive and thorough. Each of the eleven curricula examined has a tinge of provincialism that is characteristic of the college or university from which it sprang. These evidences of individualism are to be commended, for they are expressive of local needs or the genius of strong men in the teaching staff. Notwithstanding the excellence of the individual courses, I am constrained to call attention to a few matters of much concern to the veterinary profession because they bring its members in closer contact with the problems they have to solve. It is not my purpose to attempt to formulate a standard curriculum, but rather to call attention to a few modifications that I believe may be made with profit to all.

The first change I would suggest pertains to the organization of our curricula. My thought in this connection is to arrange the subjects that are common to all schools in the same sequence, thus securing uniformity in the year of the

course for each subject. I recognize that there are honest differences of opinion as to the logical prerequisites for the basic subjects, but that does not preclude the desirability of uniformity in the order of study. The strongest argument against an inviolable sequence of subjects is found in the variation in the order in which they are given in the existing courses.

My reason for urging this uniformity is to simplify the transfer of students from one college to another. It happens frequently that, for good and sufficient reasons, students, especially from States where there is no veterinary school, find it advantageous to change from the college they are in to another. Such students find, quite to their dismay, that in the college they wish to attend there are basic subjects taught in the year or years they have passed and which they have not had. This difference in the mechanism of the curricula is perplexing, for in spite of the desire of the student and the willingness of the faculty, the transfer is made difficult or impossible.

Another reason for easy transfer is that there are, and there probably always will be, outstanding men among the teachers of the different subjects in the various colleges. It is not likely, and it should not be, that any one school will have in its faculty the most thorough, inspiring or influential teachers in all of the subjects. From the very nature of things veterinary practitioners must do a general practice. To render service they must deal with all the diseases of all species of animals in their community. There are opportunities for, and there should be, a few specialists. They must depend very largely, however, on clients who can afford to call a veterinarian from a long distance, and on small-animal practice, where the patients may be sent to the specialist as in human medicine. The veterinarian who serves a community must go very largely to his patients, and there are not sufficient cases of a single disease in a restricted locality to support a specialist. The development of community interests is tending gradually, and in many places already obtains, to unify the livestock industry of localities so that the dominating business in livestock is dairying, raising of beef cattle, swine, sheep or poultry. As a rule, the dominating species of animals in a community determines the specialization of the practitioner who serves it. The colleges, therefore, must furnish instruction adequate for all of the so-called specialties and include it in the regular course. The tendency

toward this limited specialization is stimulating students who are preparing for a particular line of work to transfer, when they come to this subject in their course, to the college that has in its faculty the most distinguished teachers in that field. If the colleges are to serve the public by preparing veterinarians, it would seem that they should make such transfers as easy as possible. There may be other reasons, but those I have mentioned are quite enough to justify reasonable effort to unify the sequence of subjects in our curricula.

The second question is in relation to the subject matter to be taught. Those who have watched the growth of new knowledge in their particular field of study, with the point of view of the teacher, realize that the time devoted to the subject in the curriculum is becoming rapidly out of proportion to the number of facts the teacher feels should be imparted to the student. While this statement may not be applicable to all departments, in some it is a matter of much concern. A hurried, superficial survey of the entire subject does not discipline the student in the fundamental facts and principles that he is to utilize in practice. If a thorough drill is given in the foundation facts the time is consumed before the subject is covered. Which course should be followed? Would it not be better to select, through a committee of teachers, the topics that should be presented?

Another point intimately associated with the choice of topics is the subdivision of departments dealing with fundamental subjects into separate departments and general courses into separate units of instruction. For example, in the subject of bacteriology, should separate courses be organized to teach the different integral parts such as "the life conditions, function and classification of bacteria," "serum and vaccine therapy" and "immunology," or should they all be combined in a comprehensive course in microbiology? Again, should microbiology be in a department separate from pathology? The latter includes both etiology and tissue changes, while the former deals with the causes only. Can these subjects be taught better, from the veterinarian's point of view, together in one department or in separate and independent departments? Again, the teacher of anatomy is confronted with a like problem. For years the study of this subject was restricted to the horse because the practice was confined to the equine species. Today practice includes all farm and pet animals. The diseases of cattle, swine and

poultry are being studied and treated quite as thoroughly as those of the horse. With this change in practice, what anatomy shall be taught in the time allotted to the general subject and what shall be omitted? As the general practitioner can not be a specialist in all of the sciences that contribute to the sum total of his professional knowledge, it behooves us as teachers to bring forward the facts and principles in our respective sciences that will be most useful to the graduate. The practical parts of a subject can be taught just as scientifically as any other. I believe, therefore, that the choice of topics is a matter of vital importance for the curriculum. Until recently the need for selection has not been serious, but now that the wealth of knowledge in every subject is so vast that the teacher has not time to present it or the student capacity to learn it, the choice of subject matter has become a veritable problem. For these reasons I have made bold to raise the question and to appeal to the teachers to differentiate the topics to be taught in the subjects called for in the curriculum and those that must be acquired later.

The third and last question I wish to raise is whether or not we are including topics enough in animal husbandry, dairy industry, poultry culture, milk hygiene, meat and food inspection and possibly others that correlate veterinary medicine with agriculture and the public welfare. A study of the curricula now in operation shows that many of these subjects are taught in some of our colleges and omitted in others. Again as only a high-school diploma is required for entrance, should there be included in the curriculum such subjects as English, economics, business law, modern languages or public speaking as part of the professional course? One or more of these subjects are taught in a few of the colleges. If they are to be included, as an aid to general culture, which of the technical courses should be omitted? The pedagogical principle that too many subjects can not be taken successfully at one time precludes overcrowding the schedule. In our experience professional studies and those in liberal arts when taken together have not been compatible. The curricula of eleven of our colleges show that, as a rule, general cultural courses are not numerous, although the need for them, as well as those of technical agriculture, is strikingly in evidence.

The opinion has been expressed that the veterinary curricu-

lum should contain more subjects pertaining to agriculture. There are those who have encouraged the substitution of a limited number of such subjects for an equal number of hours in the veterinary curriculum when the candidate is a graduate of an agricultural college. We can not deny that such graduates are entitled to consideration and that men of such training are needed greatly in veterinary medicine. However, it is not easy to select subjects of a professional nature that could be replaced to advantage by agronomy, advanced botany, entomology, floriculture or farm management. The appeals that often come for veterinarians to locate in small country places where their services are needed and where a well-prepared practitioner can easily become the leader of the animal husbandry, suggests the wisdom of at least some compromise with agricultural subjects. Notwithstanding the attractiveness of such a combination, is it wise, when the approved technical subjects of a strictly veterinary nature are more than enough to fill a four-year curriculum, to introduce others? The veterinary schools are confronted with a serious problem—the rebuilding of a curriculum to conform to the rapid progress in the sciences on which the art of veterinary medicine rests.

SUBJECTS OF PRESENT CURRICULA [1]

Subject	*Colleges* [2]
FIRST YEAR	
Anatomy	11
Animal husbandry	7
Botany	7
Chemistry	11
Civics and economics	1
Clinics	2
Embryology	2
English	5
Histology	8
Hygiene, human	9
Library	1
Military science	9
Pharmacy	1
Physics	2
Physiology	4
Zoology	6
Zootechnics	1
SECOND YEAR	
Anatomy	11
Animal husbandry	5
Bacteriology	10
Biochemistry	1
Botany	3
Chemistry	5
Clinics	3
Conformation	1
Dairy husbandry	1
Dentistry	1
Economics	2
Embryology	3
English	3
Histology	4
Hygiene, human	6
Materia medica	5
Medicine	2
Military science	9
Obstetrics	1
Parasitology	2
Pathology, general	9
Pharmacy	6
Physical diagnosis	1
Physiology	11
Restraint	1
Surgery, general	2
Zoology	3

[1] The subjects included in the curricula of eleven of our oldest State veterinary colleges in the United States and Canada.

[2] The number of colleges in which the subjects are taught.

THIRD YEAR

Subject	Colleges
Anatomy	2
Animal husbandry	9
Autopsies	1
Bacteriology	5
Clinics	8
Consulting clinic	1
Contagious diseases	1
Dairy	5
Diagnosis, laboratory	1
Embryology	1
English	1
Horseshoeing	4
Hygiene, human	1
Hygiene, veterinary	1
Infectious diseases	3
Jurisprudence	1
Lameness	1
Materia medica	4
Medicine	10
Military science	2
Modern language	1
Obstetrics	2
Ophthalmology	1
Parasitology	6
Pathology, general	6
Pathology, special	6
Pharmacy	4
Physical diagnosis	6
Physiology	1
Poisonous plants	1
Poultry	2
Public speaking	1
Small-animal clinic	1
Small-animal diseases	4
Surgery	6
Surgery, general	5
Surgery, special	2
Surgical exercises	1
Surgical clinic	1
Therapeutics	3
Urine analysis	2

FOURTH YEAR

Subject	Colleges
Ambulatory clinic	2
Anatomy, surgical and applied	1
Animal industry	4
Autopsies	3
Bacteriology	2
Business law	1
Canine medicine	2
Cattle diseases	1
Clinics	9
Consulting clinic	1
Dairy industry	2
Diagnosis, clinical	1
Diagnosis, laboratory	2
Diagnostics	3
Dissection, regional	1
Entomology	1
Horseshoeing	4
Hygiene, veterinary	3
Immunity	4
Infectious diseases	5
Jurisprudence	6
Lameness	1
Materia medica	1
Meat and dairy inspection	10
Medicine	10
Modern language	1
Obstetrics	8
Operative practice	3
Ophthalmology	1
Parasitology	2
Pathology	2
Pharmacology	2
Poultry diseases	2
Practice of medicine and jurisprudence	1
Protozoology	1
Public speaking	2
Small-animal clinic	1
Small-animal diseases	1
Surgery, special	10
Surgical clinic	2
Surgical exercises	1
Therapeutics	4
Veterinary sanitation laws	2

DISCUSSION

CHAIRMAN PICKENS: The discussion on this paper will be led by Dr. D. S. White, of Columbus, Ohio.

DR. WHITE: The problem of a veterinary curriculum is one that I have been struggling with for nearly thirty years. I do not believe it is as near a solution now as it was then. In the early day things were much simpler, less complex than they are now. The most flourishing college at that time on this continent gave a very brief curriculum of five months, which was repeated, at least in part, the next year for another five months. Compared with present curricula, it would be perhaps considered a failure, but, nevertheless, that institution did turn out some very good men; many of the leaders in our profession are graduates of the old Ontario Veterinary

School. I think the secret of their success was this: They didn't teach much, but what they did teach they taught well.

I think we are attempting to teach entirely too much. Our curriculum is so cluttered up with a great mass of diversified subjects that about all the student can hope to get out of it—the student who sits in class from 8 o'clock in the morning until 5 in the afternoon, with an hour for lunch—is a very bad case of mental indigestion.

I feel, in talking to the most intelligent of our alumni, that what the student wants to get in college, whether it be in a veterinary college or a college of some other type, is something that he can not get outside of college—namely, the fundamental principles underlying, first, the basic subjects which form the foundation of the professional and technical work, and later the fundamental principles underlying the professional side.

We are passing through, I think, what the medical profession passed through. I have been told by credible authority that there are nineteen possible specialties in medicine, and ten years ago every medical school tried to make nineteen different kinds of specialists out of each student. The result is obvious. They have departed from this plan.

I concur fully with Dr. Moore in his suggestion that more agriculture, as he calls it, be included in the curriculum. We made an experiment in Ohio State. We found first that there was a demand coming from young men who had gone into animal husbandry for more veterinary training than we could give them in an agricultural course. We also discovered that the required work in a four years' course in agriculture as given at this university required only two years, the other two years being made up almost entirely of elective subjects. So we induced the agricultural faculty to permit students to elect in those two years entirely veterinary subjects. That made possible a combined curriculum of six years. At the end of the four years the students who have successfully passed through receive a degree of Bachelor of Science in Agriculture. At the end of six years they receive a degree of Doctor of Veterinary Medicine. We surrendered nothing practically in this combination course. How popular it will be I know not, because it has been so recently instituted.

The attempt to standardize these curricula is one that we thought about a good deal. In fact, during the great war an effort was made to standardize them, and a committee was appointed, but nothing came of it. Each college felt that the local conditions governing its organization brought too much pressure to bear to make any great departure from the present organization of the curriculum in the institution concerned, and we must cater to local conditions—there is no doubt about that. I think that the institution which I represent should, in a measure at least, first serve the people of the State of Ohio, who must pay the bill, and we therefore rather resent any outside institution as long as we feel we are serving those people and doing it in a professional and in an ethical way. I presume all other institutions feel very much the same. So, while it might be a laudable ambition to standardize these curricula in the different schools throughout the country, I do not believe you will ever see it fully realized.

CHAIRMAN PICKENS: Dr. Stange, of Iowa, follows in the discussion.

DR. STANGE: I think Dr. Moore covered the ground pretty well. I might mention one or two problems that we have had to deal with out in Iowa. We used to have a great many different subjects in our course; many of these subjects were one and two hour subjects, and I see a good many of them listed on this chart.

We came to the conclusion that everybody who was teaching a subject necessarily would take a certain time for preliminary work—

that is, sort of a basis for the particular subject—and then lead up to the subject matter. We came to the conclusion that inasmuch as our course was becoming crowded, and we were finding insufficient time in four years to cover the material, it would be better to establish fewer courses and make them four and five hour courses if possible. In that way you don't cover the same material possibly two or three times during the time the student is in college. I think we have solved that problem fairly well with subjects that are entirely foreign to any of the other subjects in the course.

The other problem that we had was that we found insufficient time in four years to cover the subjects that are crowding into the course, and we have had to choose between what we consider the more important subjects and the less important ones. We have had to take some subjects from our course which we thought were very valuable courses, but, nevertheless, they were less valuable than some other courses that we wanted to put in, so that we have had to cut down on subjects that Dr. Moore has mentioned, like animal husbandry. We have had to omit some of those courses and replace them with others.

We met the problem very much as Dr. White says they have, by joining with the agricultural people and putting in a six-year course. We have had that course now for several years, and every year we have, I think, some five or six students in the six-year course.

DR. WHITE: I would like to ask of the deans represented here if any of them are on the so-called point system. We have instituted there in Ohio State, beginning this October, the so-called point system. We grade the students A, B, C, and D. A carries four points; B, three; C, two, and D, one. E is a failure. Now a student must receive so many points to graduate. In other words, he may theoretically pass everything, but practically not get through the course. I am afraid that is going to go pretty hard with our fellows, and I just wondered if any of you have had any experience with it.

DR. RICHARDSON: We have had that system. In other words, it is possible for a man to get a grade of D, which represents a grade of 60, and not be able to graduate.

CHAIRMAN PICKENS: We will hear from Dr. Klein.

DR. KLEIN: Dr. Moore has presented very clearly some of the difficulties in connection with the arrangement of a veterinary curriculum. Our past experience has given us reason to think that it is a very difficult matter to arrange a curriculum which will be entirely satisfactory to everyone. Nevertheless it seems to me that there are certain basic principles that could be laid down which might serve as a guide and be carried out in so far as local conditions will permit; because we can not overlook the fact that the arrangement of a veterinary course is very often—in fact, nearly always—governed by local conditions.

We could draw a line of separation through the veterinary course between the second and third years and on the left-hand side we can put all of the basic sciences and the teaching of scientific facts and principles, leaving the other side of the line for teaching the application of those principles. In other words, we put on one side of the line the so-called scientific subjects and then on the other side of the line the so-called practical subjects.

Another thing that Dr. Moore brought up was the time that should be devoted to each subject. That is always going to be, I think, a very difficult point to decide. Usually the most able man in a faculty gets all the time he wants and the other men have to divide what is left as well as they can. I know of only one instance in which a course was carried through or made up just exactly as someone wanted it, and that was during the war. The Educational Department prepared for the War Department a schedule of classes for

a veterinary school, and in this schedule they specified the hours that each subject was to have, and that was turned over to a board consisting partly of veterinary officers and civilians and they had orders to prepare that course for introduction into the veterinary school, and it was so carried out; and if the war had lasted a little longer we would have had a veterinary course in all veterinary schools in exactly the same way. Only under some such conditions will we have such arrangement in effect, and I am not certain that it would be a good arrangement, because it would not permit of the school taking care of local conditions. Some diseases, for instance, or some subjects, which are important in the North are less important in the South, and some which are important in the South are less important in the North.

Now as to how the subjects shall be divided. Dr. Moore mentioned bacteriology. He brought up the point as to whether bacteriology should be divided into different sections. I may be wrong on that point, but my idea is that the bacteriologist should teach bacteriology, just as the anatomist should teach anatomy in general, and then the pathologist should apply the bacteriologist's teaching in special pathology.

DR. WEGNER: It seems to me that the time is right now for veterinarians to begin to specialize. It may be true that the practitioner in the small town does not have need for this specialty, but I do know of a number of veterinarians who would have been very sadly perplexed had they not known where to turn to get some valuable, special information that they needed. The poultry industry in the Northwest at the present time needs some men who are capable of taking care of the health of that industry. I think the demand is now for specialization in veterinary medicine. A year ago at our meeting several men asked me, "Where can we get some special work on sanitation?"

There are positions that we could get if we could go into the city and say to the commissioners, "We are capable of taking hold of your sanitary matters and running your city." If those men could go for a few months and get special training along those particular lines, I am sure they would be glad to do it.

A word regarding the point system. I do not believe that is going to hurt anybody who has the proper qualifications, because we figured it on the basis that the man who gets the grade of the average student is not going to have any trouble with it.

DR. KLEIN: While Dr. Moore's paper has been discussed to some extent, it has not, in my opinion, received the attention it deserves. I hardly think it would be possible in a meeting of this character to give it the necessary consideration. I, therefore, move that a committee be appointed, consisting of one representative of the faculty of each approved veterinary school, to take up the suggestions in this paper, and report, at the next meeting, a plan, if possible, for giving them a thorough study.

(The motion was seconded.)

DR. EICHHORN: I believe it is very opportune at this time to give this consideration. I do not know that any section has power to have a committee appointed. I believe it would be advisable, owing to the importance of the subject, to take it up in the general session, and request that a committee be appointed by the President of the Association. That would be a better procedure.

DR. KLEIN: If this section is not permitted to appoint the committee without the approval of the general session, I would suggest that this section vote on this motion, and if it is approved the chairman of the section can take it up in the general session. We can present it to the general session as a proposition approved by the section.

DR. EICHHORN: That is satisfactory.

CHAIRMAN PICKENS: Will you state your motion again?

DR. KLEIN: My motion is that a committee be appointed, consisting of one member from the faculty of each veterinary school approved by the Association, to take up the paper of Dr. Moore and consider the suggestions he made, and report to the next meeting of this Association a plan for carrying out or for making investigation that may be necessary.

DR. DIMOCK: What relationship would there be between this work and that of the Committee on Intelligence and Education?

CHAIRMAN PICKENS: As I understand this motion, it is a case of referring it back to the main body. I should think that would automatically place it with the proper committee.

DR. KLEIN: My motion is for the appointment of a special committee to take these suggestions into consideration, and report the plan for investigating the proposition. I don't think the status of this special committee would place them in a position to inspect veterinary schools and decide whether or not they are complying with the rules of this Association. This is a matter of considering the veterinary curriculum with the idea of bringing about more uniformity in the curricula in the different schools. Whatever recommendation this committee makes would have to be reported to the general session of the Association. Then, if it is proper that it should be referred to the Committee on Intelligence and Education, they will be so informed. I can't see that the appointment of this committee will in any way encroach on the duties of the Committee on Intelligence and Education.

CHAIRMAN PICKENS: The only point I see is that I don't know whether the section has power to appoint a committee or not. Does anybody know?

DR. DIMOCK: It seems to me that all we can do is recommend to the general session. I don't see why we can't recommend that the regular Committee on Intelligence and Education take this up.

DR. KLEIN: The objection to that plan is that in considering any proposition in regard to making the curriculum uniform in the various schools, local conditions have to be taken into consideration, and I have endeavored to provide for consideration of local conditions by having a representative of each teaching staff on this committee. My purpose in suggesting the appointment of this committee at this time is that they will take a general view of the situation and agree upon some plan whereby the committee of investigation, if necessary, may be made. For instance, in the teaching of anatomy this committee might recommend that a committee of anatomists be appointed to consider certain subjects and certain phases in the teaching of that subject. The purpose I have in suggesting the appointment of this committee is that a very general survey should be made by the committee of the conditions existing in the different schools, and then they should report on the possibility of carrying out Dr. Moore's suggestions; and, if it appears possible, those suggestions can be carried out. The best way is to undertake that task.

CHAIRMAN PICKENS: I don't know whether it is in the province of the section to appoint committees or not.

DR. KLEIN: There is no doubt that the section has the right to make the recommendation.

CHAIRMAN PICKENS: Will you amend your motion that we recommend?

DR. KLEIN: I will amend it that we recommend to the general session that a committee be appointed.

DR. MOORE: I think the Committee on Intelligence and Education is going to make a recommendation for the appointment of a committee. I was talking to Dr. Bergman some days ago about the de-

sirability of studying the situation, and he thought it ought to be taken up, and at the time I read my paper he said he was going to recommend the appointment of a committee consisting of two or three men from each college, and those men should be elected or appointed by the college, or by the dean of the faculty of those colleges. Dr. Bergman was not here when the paper was discussed. He told me afterwards the reason he was not here was that he had thought it over and deemed it better to take the recommendation of the Intelligence and Education Committee. I think he has a resolution of recommendation.

DR. KLEIN: In that case, I will withdraw my motion if that has been taken care of.

CHAIRMAN PICKENS: With the permission of the second, we will withdraw the motion.

(Consent of the second was given, and the motion was withdrawn.)

MARKED CHANGES IN BEEF PRODUCTION

Beef production in the United States has undergone marked changes since 1850, and chief among them is the difference in age to which animals destined for slaughter are kept on the farms.

With a larger proportion of beef cows kept, and with cattle slaughtered at an earlier age, it is now possible to raise more beef each year than when there were more cattle in the country than at present. However, the system of using younger cattle for beef involves the use of more harvested feed per 100 pounds of beef produced, since a larger proportion of the gains in weight are made in the feed lot than was formerly the case when steers were carried four or five seasons on grass.

While the total number of cattle in the country has decreased in recent years, the situation is not as serious as might appear, since the number of cattle is greater now than any year from 1896 to 1917.

That the country can readily respond to a quickened demand for beef was demonstrated during the war when production was so stimulated that during 1917 and 1918 combined more than 1,000,000,000 pounds of beef were exported, which was 7 per cent of our production and 22 per cent of the exports of the world during that period. Since about 1905 South America and Australia have been the chief sources of surplus beef.

Americans are eating less beef per capita than formerly, but the figures show that when demand and prices provide sufficient stimulus the supply can be increased at a surprisingly rapid rate.

SEQUELÆ OF CANINE DISTEMPER[1]

By WILLIAM E. MULDOON

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DISTEMPER may be defined as an acute, contagious, infectious disease of young canines, which is characterized by febrile manifestations and an acute catarrh of the mucous membrane. This condition is frequently followed by numerous pathological changes, either temporary or permanent, in various tissues of the animal's body. As we are particularly concerned with the sequelæ of this disease, it is advisable to discuss the subject in a more or less systematic way and endeavor to emphasize the more important forms of distemper and the complications which may follow each form.

In regard to the symptoms of the disease as a whole it may be said that the first thing noted is usually a fever of from 103 to 104 degrees. This is accompanied by prostration, dullness, impaired appetite, erection of the hair along the spine, shivering, trembling, seeking a warm place, fatigue on slight exertion, hot, dry nose, and burning pads of the feet. Later the temperature may descend to normal, or there may be alternations of rise and fall. One of the most characteristic symptoms of distemper is the implication of more than one set of organs, so that morbid manifestations referable to the nose, eyes, throat, stomach, skin and nervous system, and occurring in the same subject, are to be especially noted. In enumerating the prominent symptoms caused by disease of one set of organs, therefore, it is not implied that the absence of others referring to a different class of organs is to be understood. On the contrary, a complication of several is especially significant of the disease, though the predominance in one class of organs will signify a special form of the disease.

RESPIRATORY SYMPTOMS

One of the earliest symptoms is usually sneezing with a redness of the nasal mucosa, followed by a mucopurulent blocking

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

of the nose, and rubbing of it with the paws. With the implication of the throat there is usually local tenderness and a hard, painful cough, which may be accompanied by retching or vomiting. The breathing becomes snuffling, especially in the short-nosed dogs, and rapid and even oppressed in case of implication of the smaller bronchi and the lungs. The nostrils may become glued together, the discharge red or dark colored. Vesicles and sores may appear on the mucosa, and the cough may get paroxysmal, small, weak, husky or gurgling.

Percussion of the lungs may reveal small areas of flatness from exudate or collapse, and in the case of pleurisy and hydrothorax there is lack of resonance up to a given horizontal line, varying in position according to the position of the animal and always keeping to that part of the thorax which may at the time be lowest. Auscultation will reveal various sounds, according to existing lesions. There may be a loud, blowing murmur over the large bronchi, or at points to which this sound is conveyed through consolidated lung. Or a course of finer mucous rales may be present, indicating the second stage of bronchitis; or a line of crepitation around a nonresonant area, indicating pneumonia; or there may be friction sounds, or later, creaking murmurs from false membranes. Wheezing sounds are not uncommon, also sounds of the heart, bronchi or bowels, heard in unwonted situations to which they are conveyed through consolidated lung tissue. Dyspnea may become extreme, with puffing out of the cheeks, labial souffle, and violent inspiratory action. Emaciation, sunken, pale or dark red eyes, putrid diarrhea and nervous disorders usually precede death.

Regarding the animals which recover from this type of distemper nothing need be said, but we are at times confronted with various chronic sequelæ which often cause the small-animal practitioner a great deal of worry. Under this head we may mention the following:

1. *Chronic Nasal Catarrh.*—This is usually shown by a purulent discharge, varying in quantity, from both nasal passages. This discharge in severe cases is streaked with blood and has a very offensive odor; it causes excoriations on the mucous membrane and skin at the nasal openings, where it forms dry and hard crusts. There are frequent paroxysms of sneezing. In

cases where the nasal passages are occluded the animal breathes through its mouth.

In handling this condition the best results will probably be obtained by keeping the animal in a warm place and spraying the nasal passages daily with a solution of creolin 2 per cent, boric acid 2 per cent, or sodium bicarbonate 2 per cent. The dried crusts should be removed with warm water, and zinc oxid ointment applied to the membranes and skin at the nasal openings. If this treatment fails, cultures may be grown from the nasal discharge and a standardized autogenic vaccine made. Two cubic centimeters of this vaccine should be injected subcutaneously every five to seven days until the purulent discharge ceases.

2. *Chronic Catarrh of the Larynx.*—The symptoms of this condition are similar to those of acute laryngitis except that they are not so severe. The cough sounds dry, hoarse, rough—sometimes moist—and it is frequent, quite loud, and accompanied by a wheezy inspiratory sound, and in rare instances with retching or even emesis. In some cases the cough resembles the whooping cough of children. It is heard mostly at night, or when the animal runs and plays as he would do before being taken out for a run.

As a rule the treatment of this disease is unsatisfactory, but it depends to a large extent on the condition of the animal. Various cough mixtures may be prescribed to allay the irritation and lessen the coughing. Inhalations of medicinal agents, such as turpentine, etc., may be of value. The best method is to put the animal on a cane-seated chair, and having placed the medicated agent, steaming hot, underneath the chair, to cover the dog with a sheet and by holding him compel him to inhale the vapors for ten or fifteen minutes. Direct applications of silver nitrate 1 to 100 may be used in some of the more obstinate cases. In making these applications to the larynx an assistant holds the mouth open with tapes, the tongue is pressed down with a spatula or the handle of a spoon, and the throat is sprayed by means of an atomizer.

3. *Chronic Interstitial Pneumonia.*—This is a frequent sequel to the respiratory form of dog distemper, as in the course of this condition resolution does not take place and the fibrinous

exudate collected in the alveoli during the stage of red hepatization is displaced by a fibrous tissue. The symptoms usually shown are a moderate dyspnea and a chronic cough, with a nasal discharge which may be slight or profuse. The exhaled air has a fetid odor, due perhaps to some smaller abscess formation. The temperature is usually normal and often no marked symptoms are noticed. In some cases dropsical effusions are present, and the animal may suddenly die if compelled to exert itself.

The prognosis of this condition is bad and the disease is usually considered incurable. However, one may prescribe expectorants and use general stimulants to modify the symptoms, and a thorough course of potassium iodid may prove of value.

4. *Pleurisy with Effusion.*—We are not particularly concerned with primary pleurisy, except where there is an effusion present in the chest cavity. When the effusion present is in large quantities, excites much dyspnea, becomes purulent or remains unabsorbed after from ten to twenty days, proper treatment should be undertaken. Diuretics and cardiac stimulants have only an indirect influence on the accumulations, and when the exudate is gradually absorbed one can hardly credit these drugs with accomplishing the results, as the exudate is usually reabsorbed when the acute inflammatory stage of the disease has passed.

The best method of treatment is the removal of the fluid by surgical means; that is, by puncturing the chest wall. This is best performed by means of a thoroughly sterilized trocar and cannula or aspirating needle. It is best done with the animal either in a sitting or a standing position. Remove the hair from and disinfect a small area on the side of the chest so that the instrument may be inserted in a forward direction at the anterior border of the sixth, seventh and eighth ribs, and as low in the cavity as possible. The amount of fluid that may be removed depends on the heart action. When the heart becomes weak and rapid or when coughing suddenly develops, the operation should be discontinued. If necessary the chest may be tapped daily at a different site of puncture until all fluid is removed.

EAR SYMPTOMS

Inflammation of the external auditory meatus with the formation of vesicles and discharge is a common lesion (50 per cent).

It is marked by pain and tenderness, which usually disappear during convalescence. In some cases a chronic catarrhal condition of the canal is left which requires constant care for some time in order to perfect a cure. In such cases the ear should be carefully cleansed with pledgets of cotton saturated with ether. The canal should be made dry with clean gauze or cotton and a drying antiseptic powder introduced carefully into the ear as far as possible. If there are ulcerations present in the meatus it is advisable to anesthetize the canal first by dropping a 4 per cent solution of cocain into the canal and then touching up the ulcerated areas with stick nitrate of silver or by instilling a 5 per cent solution of the silver nitrate into the ear. Should the animal shake the head continuously, or in any way hinder the treatment, a head cap should be employed for a few days.

Deafness may follow distemper in dogs. It is probably due to a paralysis of the auditory nerve. Treatment is usually of little value, although good results may be obtained in some cases by building up the animal's strength and administering fairly good-sized doses of strychnin sulphate, according to the animal's size, over quite a period of time.

Eye Symptoms

Conjunctival congestion is one of the earliest and most constant symptoms. Weeping, swollen eyelids and reddened mucosa are seen. Photophobia may bespeak keratitis. Soon the watery tears become mucopurulent, matting together the lashes and even the lids, especially during the night, so that they must be sponged to get them apart in the morning. Vesicles exceptionally appear on the conjunctiva; more frequently it becomes cloudy and opaque, and at points near the center degeneration of the epithelium leads to the formation of ulcers, no larger than pinheads but extending into the cornea and sometimes perforating it so as to allow protrusion of the membrane of Descemet or the escape of the aqueous humor. The formation and extension of the ulcers are favored by the animal's general debility, by rubbing of the eyes with the paws, and by the infection of abrasions with pus organisms. This infection may extend to the lining membrane of the anterior chamber, and even of the posterior, with panophthalmia, but in the absence

of perforation internal ophthalmia is rare. When the ulcers heal, white cicatricial spots, or black points caused by the adhesion of the uveal pigment, remain.

Chronic conjunctivitis frequently follows distemper and often persists a long time. The conjunctiva is somewhat thickened, and the secretion is scanty and of a mucoid character, and is deposited at the angle of the lids. In some cases there is little or no secretion and the membrane is reddened or dry. When this is the case increased winking occurs in order to moisten the cornea. The secretion upon the edges of the lids may produce an inflammation and cause the lashes to fall out; it gives the whole eye a heavy, drowsy appearance. When the condition has been severe, entropion or inversion of the lid often occurs, and in a large number of cases this is the real cause of the eye trouble persisting.

The uncomplicated chronic conjunctivitis may be treated by means of astringents such as zinc sulphate or copper sulphate in from 0.5 to 1 per cent solutions. If crusts form about the margins of the lids, apply yellow oxid of mercury ointment every night and wash it off next morning with a solution of bicarbonate of soda. This will soften the crusts, prevent the lids from sticking together, and allow the secretion to flow out more freely.

If an inversion of the lids is present surgical treatment is necessary in order to afford permanent relief. An elliptical piece of skin is removed from the eyelid parallel to the margin and about one-eighth to one-quarter inch from the edge of the lid, and the skin sutured so that the lid will be drawn out or everted. A certain amount of judgment is necessary to determine the amount of skin to remove in each case. After the operation the wound is covered with a flexible collodion dressing and the sutures removed in three or four days. Care should be taken to avoid injury to the deeper structures or to the margins of the lids when operating.

Opacities of the Cornea.—These are the result of an inflammation of the cornea, following dog distemper, and may be designated according to their density as (*a*) nebula, a slight turbidity; (*b*) macula, a denser opacity easily seen in ordinary light; (*c*) albugo, a translucent opacity; (*d*) leukoma, the entire cornea becoming turbid or milk white. The prognosis depends upon the age of the patient and the duration, location, extent and character of the opacity. The more recent the

opacity the more favorable the prognosis. As most of these opacities are composed of cicatricial tissue, complete removal of them is very difficult. Dionin is the drug which will probably give the best results when applied either in solution (5 to 10 per cent) or in the powdered form. It is advisable to begin with a few drops of a 5 per cent solution instilled into the eye several times daily, and increase the strength of the preparation later if necessary. The powdered form may be dropped into the eye daily for about a week, and a week or ten days allowed to elapse before the treatment is repeated. A severe reaction usually follows the first treatments but this disappears after about a week. Yellow oxid of mercury ointment has also been used with good results, as well as silver nitrate solution in 4 per cent strength. To obtain results any treatment must be continued for a long time, and the prognosis in these cases should always be guarded.

DIGESTIVE AND HEPATIC SYMPTOMS

Anorexia and vomiting may usher in the disease. Buccal congestion, dryness, clamminess and fetor are marked symptoms and there may be some yellowness of the mouth and eye. The patient may at first be constipated, but diarrhea often sets in early, with tenesmus, much fetor, mucous froth and even blood, also abdominal pain and tenderness. The abdomen is habitually tense and contracted. Ulceration of the mouth, gums and rectum, invagination, prolapsus ani, jaundice, septic pneumonia, paralysis, and convulsions or cutaneous eruptions are occasional complications. The abdominal type of distemper is especially fatal. In its early stages debility, prostration and drowsiness are marked features.

We need not say much concerning the after effects of dog distemper upon the digestive tract, as the condition usually rights itself as the animal returns to normal. In some cases there may be a persistent gastritis or gastroenteritis which may remain for some time, but if the patient is properly fed and cared for this usually disappears. In case it should not, we can only recommend the regular outlined treatment which is used in these conditions when due to some other cause. It is quite probable that the continuous administration of more or less irritant drugs over a period of weeks in the treatment of the primary disease is the cause of this condition.

CUTANEOUS SYMPTOMS

In a great number of cases skin eruptions are observed at some stage of the disease, and may remain as a sequel for a time after apparent recovery. In some cases the only prominent symptoms are a high fever and skin eruption, and in these cases recovery may be looked for with some confidence. The lesions are most prevalent on white-skinned dogs with short hair, and on the most delicate parts of the skin (abdomen, scrotum, perineum, inside of the thighs and elbows), but they may extend over the whole body and even encroach upon the mucosa. They vary much in different cases and stages. There may be punctiform reddish spots, changing to hard elevated papules, and in some cases to vesicles and even pustules. The vesicles may be small and pointed, but more commonly they are rounded and flat and as large as a lentil or a small pea. When first formed they contain liquid exudate which may be clear and transparent, but is often reddish or even violet. The individual vesicles tend to burst and dry up, but others appear, and thus the eruption will continue for weeks, the skin meanwhile exuding a sticky, greasy, offensive-smelling exudate which mats the hairs together. Itching is usually slight, yet in given cases excoriations are produced with considerable moist discharge. These skin lesions tend to spontaneous recovery when the general health improves, and appear to be little affected by treatment.

NERVOUS SYMPTOMS

Nervous symptoms are shown more or less from the beginning. The great dullness, depression, apathy and weakness which usually usher in the disease are indications of a deranged nervous system. Drowsiness may be shown early. Even the early nausea and vomiting may be largely central in its origin. The dog is restless and irritable, getting up and moving from place to place, starting from sleep, yelping, snapping, with twitching of the muscles of the face or limbs, rolling of the eyes, and excessive heat of the head. Epileptic attacks may appear at any stage of the disease. Tonic spasms, paresis and paralysis are usually late manifestations and often seem to be sequelæ determined by toxin poisoning of the nerve centers, or by degeneration of their structures. Twitching movements may be confined to the head, or to a limb, or they may affect the whole body. Tonic spasms often affect the neck, turning the head rigidly to one side.

The proper handling of these nervous affections following canine distemper is one of the most difficult problems that confront the small-animal practitioner. We are sorry that we have nothing specific in the way of treatment to offer, and we can only say that treatment must correspond to the morbid phenomena. Extreme prostration may demand diffusible stimulants—ether, camphorated oil, or strychnin sulphate. Spasms and other indications of congestion may be met by cold to the head and inhalations of ether, followed by rectal injections of chloral hydrate. Posterior paralysis may be treated with tonics, stomachics, easily digestible rich food, and good hygiene. Massage, rubs and the application of electricity may be indicated, and of value in this condition. A light firing along the back and lumbar region may be of some service; at any rate we have seen a few cases recover where it has been employed.

The nervous twitching so common after distemper is not, in our opinoin, a true chorea, as it is so often called, but a form of disseminating myelitis. In the majority of these cases there are more or less rhythmic contractions which generally involve the muscles of the extremities, but more rarely may affect the muscles of the neck or the abdominal muscles exclusively. The muscles of the chest and the muscles supplied by the radial and sciatic nerves are the ones chiefly involved. In the majority of cases there is a nuclear paralysis, and sometimes also a supranuclear paraplegia of certain groups of muscles of the extremities and of the sphincters. Automutilation sometimes occurs in this condition.

It has been our experience that it is absolutely useless to expect results from the administration of nerve stimulants such as strychnin, veratrin, arsenic, etc. Neither can results be expected from the full-sized doses of potassium iodid which are used by some as a routine treatment. If muscular atrophy should threaten or should be actually present, attempts should be made to check it by passive movements of the paralyzed limbs and by massage. Some authors record rapid improvements following the subcutaneous injection of eserin, pilocarpin or arecolin, but the writer doubts their value in this condition. Recently we have been experimenting with the administration of thyroid extract in these cases, but as yet our results are not worth publishing. The prognosis of these cases is always to be guarded,

and we believe that we can expect results only in the case of young animals that will receive good care over a long period of time, and thus perhaps outgrow the condition.

LESS COMMON SEQUELÆ

Some other sequelæ may follow canine distemper but are less frequently met.

Amaurosis.—This is really a symptom and not a disease, and the condition so-called which we see following distemper results in blindness without a visible lesion of the eye. It is probably due to some disturbance of the optic nerve. The principle symptoms are blindness and an abnormal dilatation of the pupil which does not react to light. In the early stages the eye appears normal, but later the globe becomes atrophied. Treatment is usually of no avail, but in some cases as the animal recovers from the primary disease the eye returns to normal.

Lymphangitis.—We have observed several cases of distemper during the course of which one or more of the legs became hot, painful and swollen. On examination the subcutaneous lymphatics were found to be enlarged and to present a peculiar corded appearance. In a few cases there was a rapid recovery, but in some an abscess was formed with an accompanying diffuse phlegmon. The therapeutic treatment of these cases consists first in the application of a cooling pack, and later, if the glands show any indication of abscess formation, in opening them by surgical methods.

DISCUSSION

CHAIRMAN FLYNN: We have just listened to a paper on one of the important subjects of small-animal practice. No one enters into the practice of veterinary medicine for any great length of time without coming in contact with canine distemper and its after effects. This subject is open for discussion.

DR. C. A. CARY (Auburn, Ala.): In the South this last year, the last six or eight weeks, we have had a peculiar excess, we might call it, of distemper in dogs, involving not only young dogs but old dogs. Among hounds where there are fifteen or twenty in the bunch it is not unlikely that all of them will have the epileptic type following distemper, probably. We have had that in numerous cases this year. In thirty years of experience in the South I have never known it to occur before. This year it has covered several States in the South to my knowledge. It is very intractable. The only cases I have seen recover are those that are a little old. The more you monkey with these cases the worse they get. I don't want to knock our profession in any sense of the word, but we are just up against it. I don't know how it is in the North, but if you have it and have means of controlling it or curing it, I would like to hear about it.

The practitioners of the extreme South are troubled very seriously

with this problem. I don't know about the Middle States. Invariably the owner of the dogs says, "Our dogs have fits." When we go to look at them we nearly always find this type of epileptic sequela. We have tried dieting; we have tried a good many of the so-called remedies for nervous trouble. We have tried sedatives and narcotics and things of that kind, and we can handle this temporarily. We have tried to get rid of the worms they say produce convulsions, but it doesn't do any good in these cases. I know that most practitioners are up against it when they encounter distemper.

I remember when I was in Francker's clinic in Berlin; Francker's great drug was calomel. We got over that and found out that calomel probably is a good purgative, in a sense, in certain stages, to eliminate what we might term bile and things of that kind; but calomel doesn't do any good in a lot of cases. I might enumerate a good many things, bacterins and others things, but I am not going to do that. I am after this one thing: Can you give me any light on these cases of epilepsy? Can you give me any help?

CHAIRMAN FLYNN: Can anybody offer any suggestions to Dr. Cary's question?

DR. FRICK: The problem of canine distemper, as we know, is the biggest problem that the small-animal practitioner has to contend with, and there are a few points I want to call attention to. One fact is that this is very similar to influenza in humans; in certain years the virulence will greatly increase and everything dies, and the next year we think we have a cure for it, and with almost anything you use the majority of them will live. I wonder if it wouldn't be a good plan if there could be some committee arranged by the small-animal practitioners to spend a definite amount of time in investigating the question of distemper, similar to the committees on tuberculosis and abortion, etc., on large-animal work.

DR. C. VANDERWARF (Chicago Heights, Ill.): I happen to have quite a bit of experience with distemper in dogs. I meet with it every day. I have tried everything, I suppose, that nearly everybody here has. I am up against it. In the past few days I have lost a couple of dogs, which was very much of a disappointment. They were a couple of bloodhounds that a fellow thought a lot of. There was a banker in our town who bought a Belgian Police dog and it died with distemper. He bought another one and told me he was going to have me immunize it. I tried to immunize it with serums, and it died with distemper. He got another one and treated it a while himself, and it died with distemper. I am up against it just the same as a lot of the rest of you.

I have a dog of my own that just plays around this stuff and it doesn't bother him one bit. I don't hold him back. When a case of distemper comes on the place I let him run. He is always loose and all over the place. That dog surely must be immune. I have had other dogs on the place that weren't any good. I let that dog with patients that are probably around, and I have had bad ones on the place that would refuse food and the discharge would be all over the food, and I fed it to this dog and couldn't make the dog diseased at all. I am not situated so as to have a laboratory, but I have just been wondering lately whether any of you have ever tried the serum of an immune dog or hyperimmune dog. I wonder if that is possible, the same as you would get serum from a hyperimmune hog. I wonder if this would be possible in the dog. I would like to hear from any of you who have tried it or had experience.

DR. MILKS: What kind of a dog is it?

DR. VANDERWARF: It is an English bull, not purebred.

DR. MILKS: It is very hard to produce distemper in a dog. There is some controversy as to the cause. We have tried the immune serum, and our dog died just the same.

DR. F. O. WALTERS (Lemont, Ill.): I have had a great deal of experience with distemper. It seems that within the last four or five years we are having more trouble than we used to have. There was a time when you could immunize a dog against distemper and make it hold, but that can't be done. It seems there is a complication present with distemper which the scientists or laboratory men haven't worked out. They say that we don't get any results from the treatment we are using at present. It seems we have more trouble in the highly bred animals. The dog fancier is trying to get a higher class dog, and I think with this high breeding and inbreeding they reduce resistance and of course the dog is more subject to these conditions. Dr. Vanderwarf spoke about his bulldog not contracting distemper. You have better success with these curs than you have with the better bred animals. (Laughter.)

DR. QUITMAN: I just want to answer a question. The paper is almost too long to take up the various points for discussion, but there has lately been going around—I dare say most of you have heard of it—the recommendation of using hog-cholera serum in the treatment of canine distemper. I just want to ask if there is anyone here who has used it, and what your experience has been. I have heard three or four, may be half a dozen, reports, and they have been extremely favorable. On the other hand, my own experience with it, which was only one case, pointed out a great danger. The one gentleman to whom I spoke at this meeting about it had tried it and he also had unfavorable results from it. That treatment does not appeal to me for this reason: Although I am of the opinion, and have been for many years, that canine distemper is due to a virus the same as hog cholera is, I feared when I heard the suggestions made, or had the reports of the value of hog-cholera serums, the danger of anaphylaxis. Of course I know anaphylaxis usually comes with the second or third dose, nearly always the second dose. The second dose brings the patient down with anaphylaxis. The case of which I speak was an absolutely hopeless case, but this pup shouldn't have died for a matter of four, five or six days. However, after receiving a dose of concentrated hog-cholera serum, he died in about 15 or 25 minutes. I was discussing with Dr. Eichhorn whether this could have been anaphylactic reaction. At first he said he didn't think it was, but when I called his attention and asked him if he didn't think canine distemper would do, he agreed in his opinion that it was. Then, discussing the thing, he finally came to the conclusion that it probably was anaphylactic reaction because of the death of the puppy in 20 or 25 minutes where it should have taken four, five or six days to die.

I would like to hear if any of you have given this hog-cholera serum treatment in canine distemper. It is my opinion that when these gentlemen report good results from it, it is a case of erroneous diagnosis, because some veterinarians call every case a case of distemper if a dog has a discharge from the nose or eyes. During the last three or four months I have had a great run of ordinary cases of coryza and rhinitis in the dog. But I know it has become a practice if the dog shows any nasal or eye discharge to call it distemper. All such cases, however, are not distemper. It is probably those cases, not true distemper, that hog-cholera serum acts upon. I think, after our information on the subject, if any of you have used hog-cholera serum either favorably or unfavorably you should make a report now.

DR. VANDERWARF: I have tried everything. I have tried clear serum on the two particular bloodhounds I was speaking about, and both of them died the same way that Dr. Quitman spoke of. With ordinary treatment I couldn't see why they wouldn't have lived for about a week or ten days or probably a month, but instead of that the one came back for the second treatment and the other never came

back at all. I used this subcutaneously. They were fair-sized dogs. I gave about 18 c.c. If any of you contemplate using it, I would say be a little bit careful about the stuff.

DR. CAHILL: Dr. Quitman has brought up one or two points which seem to me to be rather important. Thinking back a few years, I think you all remember the time when one or possibly two biological producers in this country collected practically all of the serums of different kinds and simply relabeled them and sent them out as canine serum. You older men all recall that was a prevalent custom a few years ago. The Bureau of Animal Industry forced several people to discontinue that move, and apparently no more dogs died of distemper since then than before. It seems quite difficult to see a reason why we should get a nonspecific action from hog-cholera serum in a case of canine distemper. Nonspecific therapy has been used in some diseases with apparently good results until properly investigated and experimented, and then it has proven to be more or less imaginary. I am sure the same thing will happen if anti-hog-cholera serum should be used to any extent in canine distemper.

Dr. Quitman's remarks about a case of anaphylaxis makes me think of a similar case which was called to my attention last year. From what information I have, it seems that anaphylaxis in dogs is particularly prevalent in Chicago following the use of immune serum. One large practitioner there whom I know had four or five dogs die in this manner after using canine anti-distemper serum. It was suggested to him at the time that there existed the possibility of these pups having been treated by some other veterinarian or the owner himself, and the owner not conveying the knowledge to this veterinarian when the dog was admitted to the hospital. He acted on the suggestion and endeavored to trace the matter down, and he found out that of the five dogs that died from anaphylaxis he could definitely ascertain those pups had more than eight days previously received a dose of anti-canine-distemper serum from another veterinarian. There isn't any more reason why we would get anaphylaxis in the case of anti-hog-cholera serum given to dogs than in the case of anti-distemper serum, both of which are foreign proteins. In this particular case the veterinarian who was experiencing the difficulty overcame it by sensitizing his dogs first. I might say he has completely eliminated for several months cases of anaphylaxis by giving a very small sensitizing dose subcutaneously. I have been informed by him within the past few weeks that he hasn't had a case of anaphylaxis within four months, whereas he was getting one every few days previous to that.

DR. EICHHORN: Instead of sensitizing the dog, it should be desensitized. I just want to convey the impression that we want to desensitize the animal and then sensitize him.

With regard to the use of anti-hog-cholera serum for the prevention of canine distemper I am very much of the opinion of Dr. Cahill, that up to date nothing would justify us in employing such a serum in this disease.

There is no question but what we do not know at this time the actual cause of canine distemper. I believe that the information which I received during the recent trip to Europe from the original investigators of canine distemper in Alfort, that canine distemper in their belief represents a group of diseases and not a single disease, is correct. When they designate canine distemper in the French language, they call it diseases of young dogs. So we might have to deal with diseases of young animals with different etiological factors. That is the result of the findings. Probably in the majority of cases we have to deal with the virus which is the original cause of the disease. Some of the veterinarians report unfavorable results from the use of canine distemper products as marketed today, and others report favorable results.

DISEASES OF THE CORNEA[1]

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THE TREATMENT of diseases of the eye forms a considerable part of a small-animal practice. Unlike similar work on medicine, there is no call for refractive work and consequently most cases mean the treatment of inflammatory conditions. No one line of treatment will do for all kinds of trouble or for the same disease in different animals, although with an understanding of what must be done and some knowledge of the use of different remedial agents much can be accomplished.

Probably no disease with which we come into contact and for which considerable can be done is met more frequently than keratitis in some of its forms. It is more common in dogs than in cats, and certain pop-eyed dogs, such as Bostons, "Pekes," etc., appear predisposed to it.

Examination

Normally the cornea is lustrous and transparent and the epithelium covering it forms as good a reflecting surface as the best mirror. There are no inflammations of the cornea in which these characters are not changed. The usual symptoms of inflammation are lacking in keratitis because there are no blood-vessels and the organ is not elastic. The most prominent diagnostic symptom is cloudiness, due to a collection of leucocytes that have passed in from adjacent vessels. If the cornea in such a case is examined with a hand lens its surface will appear roughened or uneven as though punctured with needles (stippled), and there is no corneal infiltration in which there is not this stippled appearance of the epithelium. This condition is sometimes seen in old scars, but they are distinguished by their color. Scar tissue is bluish or white, while the infiltration always has a yellowish tinge.

Congestion of the blood-vessels, conjunctival and ciliary, usually accompanies inflammation of the cornea, but may be absent

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

in mild cases and occasionally in severe ones. Iritis and hypopyon are frequent complications.

After a diagnosis of keratitis has been made, it is necessary to know where the disease is located—that is, whether superficial or deep. This is not easily determined from direct examination, but there are certain signs that can be used as an aid in the determination. As a rule superficial inflammations are more or less sharply defined, the deep ones less so, and have the appearance of hazy spots of irregular form. Corneal vessels also play an important rôle in the diagnosis. The superficial vessels are arborescent, tortuous, bright red, easily seen, and can be traced to their origin in the conjunctiva. The deeper ones come from the sclera and extend into the cornea in straight red lines. They are less distinctly seen because they are often covered by a densely infiltrated corneal layer. In general, superficial vessels indicate superficial and deep ones parenchymatous inflammations, but the presence of superficial vessels is not absolute evidence against deep inflammations, as in some cases the superficial accompany the deep. Deep keratitis is usually due to general infection, as in distemper.

Several distinct types of keratis are described and the disease is often divided into well-defined groups, but for practical purposes it may be divided into nonsuppurative and suppurative or ulcerous keratitis. Nonsuppurative may be again divided into superficial, deep or parenchymatous, and vascular or pannus.

Nonsuppurative Keratitis

Superficial keratitis is an inflammation of the epithelial covering of the cornea and the superficial layers of the parenchyma. It is shown by a bluish white cloudiness which may be localized or diffuse and is accompanied by lacrimation and photophobia. Resorption usually takes place in a few days. Occasionally a slight desquamation takes place, but this is so superficial as to need special attention to recognize it, although it may easily be outlined with a drop of fluorescin solution.

Keratitis punctata superficialis or *faceted keratitis* is often seen in certain breeds of dogs, especially the Pekingese. It is characterized by more or less generalized cloudiness in the midst of which small areas may be distinguished by careful examination. These spots are opaque, white, gray, or even yellowish, forming a slight relief in the cornea and penetrating somewhat.

Sometimes they ulcerate. Between these are portions of mirror-like tissue which gives a faceted appearance. This tissue may erroneously be diagnosed as ulcerous but is in reality sound tissue. The affection may affect both eyes and, according to Nicholas, should be regarded as chronic. The attacks are recurrent or tend to be periodic, the symptoms changing somewhat but not disappearing entirely in the periods between the attacks.

Treatment.—The routine treatment of nonsuppurative keratitis consists in the use of warm, nonirritating antiseptic solutions. According to Gray, the milder the better. Heroic measures are not indicated in superficial keratitis and their employment leads to disaster. The use of hot packs, two or three times daily, and instillation of such agents as 2-4 per cent solution of boric acid, 1 per cent borax, 1-5,000 bichlorid, chinosol, etc., usually effect a cure. A 1 per cent solution of atropin is useful in severe cases, both to relieve pain and lessen liability to iritis. Pain and photophobia may be relieved by a 1 or 2 per cent solution of cocain, but the continuous use of this agent is believed by many to be detrimental. Quinin and urea hydrochlorid appears to work well in these cases. It does not produce its action so rapidly as cocain, but lasts for a long time, up to 24 hours or more. After the acute symptoms have subsided calomel or iodoform in fine powder or in ointment may be useful, or the cornea may be massaged with a weak (1 or 2 per cent) yellow oxid of mercury ointment. Dionin is frequently useful and may be employed in pure form dusted upon the cornea or in 5 to 10 per cent solution or ointment. This drug produces edema of the conjunctiva and is thought to promote the flow of lymph through the cornea and in this way aid in the absorption of the exudate. It is also useful in deep-seated pain. The eye soon acquires a tolerance for this drug, hence little will be accomplished from its use for more than a week or ten days. This tolerance soon wears off and the drug may be employed again after a few days' intermission.

Pannus is a vascular growth of connective tissue upon the superficial layers of the cornea, but may be between the corneal epithelium and Bowman's capsule. It begins with keratitis in which areas become clouded and infiltrated with superficial tortuous vessels, largest at the periphery and directed toward the center. If the cause has disappeared, the new tissue be-

comes organized and takes on a cicatricial appearance, the vessels becoming fewer in number. This disease is not a common one but is occasionally seen in dogs.

Prognosis depends upon the corneal infiltration and destruction of the epithelium. It is frequently followed by opacities, but treatment will often restore an eye to a fairly serviceable condition.

Treatment consists in massaging with a yellow oxid of mercury ointment and the use of astringents. The application of dionin seems to be of considerable benefit. If very vascular, periotomy sometimes works well, but according to Gray it is not usually successful. If there is much cicatricial tissue it may be removed with a knife or currette, following this with massage with yellow oxid of mercury ointment and the application of dionin.

Suppurative or Ulcerative Keratitis

Ulcerative keratitis is a common disease of dogs. It may be primary, in which case it begins in the cornea from abscesses, wounds, or secondary from conjunctivitis. It may also be classified as endogenous, due to infections through the blood and lymph, or exogenous when due to local influences; but of whatever nature they lead to the same thing and ulceration is the result. In some cases the ulcers follow a diffuse keratitis and in others remain localized and appear as though a small amount of tissue had been gouged out of the cornea. After the ulcer has formed it may be progressive, if it is still active, or regressive, if there is a tendency to cicatrize. In this stage it is also known as a clean ulcer. The healing process is accompanied by the development in the cornea of long, flexuous, red vessels, reaching from the ulcer to the sclerocorneal limbus. Cicatrization always takes place by means of opaque tissue on a level with the corneal struma. The epithelial layer is entirely regenerated by proliferation of its margins and in the end completely covers the newly formed tissue. If entirely filled up, the cicatrix is on a level with the rest of the cornea and can be recognized by its opacity and irregular surface, but if not completely filled, a flat faceted place remains. In some cases the scar tissue does not withstand the intraocular pressure and bulges forward from the rest of the cornea—"ectasic cicatrix."

As the ulcer progresses it may extend into the depths of

the cornea, destroy its whole thickness and leave only Descemet's membrane. This may resist but more often yields, and we get a hernia of the membrane or a keratocele. As a rule, however, this membrane breaks under the intraocular pressure with consequences which will be discussed later. As long as any of the corneal layers remain, the floor of the ulcer will be opaque, but when only the membrane of Descemet is left the edges will be opaque but the floor clear.

Prognosis depends upon the extent and condition of the ulcer and the age and general health of the animals. In general, aged, diseased dogs are less favorable patients than young or healthy animals. Prognosis also depends somewhat upon the early recognition of the ulcer. As a rule the earlier recognized and treated, the better the prognosis. Hence all cases of keratitis should be examined carefully for loss of tissue. In cases of doubt, a drop of fluorescin solution (fluorescin, 1 per cent; sodium bicarbonate, 2.5 per cent) placed into the eye and immediately washed out will aid in the diagnosis. This preparation stains any denuded area a bright green but does not effect sound tissue. While making the examination one must note the condition of the ulcer—that is, whether it is in an active or healing stage. An active ulcer will have ragged edges, convex grayish base and general cloudiness and be accompanied by other local disturbances. If healing, the edges are rounded, smooth, clear, the cloudiness clearing and the acute symptoms subsiding.

Treatment.—In simple ulcers the cul-de-sac of the conjunctiva should be irrigated thoroughly with one of the mild antiseptics mentioned under nonsuppurative keratitis. Pain and photophobia may also be handled similarly. These simple ulcers often heal promptly under atropin and boric acid solution or if the ulcer be touched with a 1 per cent solution of silver nitrate or strong phenol. If accompanied with conjunctivitis, this disease must be treated also. We have found it necessary in most cases to cauterize before we could stop the progress of the ulcer. Our plan has been to outline the ulcer with a drop of fluorescin solution which stains the ulcer green. Then apply strong phenol on a probe, being careful first to shake off any drops that might accumulate. It is impossible to state whether there is any benefit from the fluorescin solution, but it seems that those cases upon which it has been used do better than the others. After the acute symptoms have subsided, or from the beginning in

some cases in which the ulcer has been torpid, some stimulation is needed. For this purpose yellow oxid of mercury ointment, 2 to 5 per cent, iodoform or calomel dusted on the cornea or in ointment, do well. Recently we have used more ointments than powders, but always irrigate the conjunctiva sac thoroughly before massaging with the ointment.

Deep and sloughing ulcers.—Hot fomentations and irrigation with the agents mentioned above are useful. Atropin is especially useful to prevent iritis and lessen pain. All solutions should be sterile to avoid infecting an otherwise simple ulcer. Some recommend a weak solution of eserin (¼ to 1 grain to the ounce). It is claimed that this drug stops the migration of white cells or promotes absorption through dilation of the ciliary vessels. Like all other myotics, eserin lowers intraocular pressure and thus lessens tendency to rupture of the cornea. Other authorities are of the opinion that atropin is invariably the better drug.

If the ulcer still progresses in spite of the milder measures, as is often the case, more heroic treatment is necessary. If may be curretted with a sharp knife or spoon until all necrotic material is removed, and the edges then touched with a mild caustic. Strong chemicals may be applied directly to the ulcer by means of a probe or a probe carrying a small tuft of cotton, taking care not to wound the sound tissue. Many chemicals may be used; silver nitrate, 5-10 per cent, or in stick; liquid phenol, 95 per cent; tincture of iodin; formaldehyde, 1-50 per cent, and many others. The actual cautery is also recommended. In each of the above-mentioned methods the eye should be anesthetized after a thorough irrigation and for the best results the ulcer outlined with fluorescein.

We have recently used liquid phenol (95 per cent), as mentioned previously, more than any other caustic. We depended upon silver nitrate in strong solution or stick for a long time, but phenol has given us better results. Dionin is often of distinct service. It acts not only as a lymphagogue and an analgesic, but also seems to be of distinct benefit in stimulating regeneration.

In cases in which perforation seems certain in spite of treatment, a dry pack should be applied and kept in position except when dressing. If the floor of the ulcer bulges, it is well to relieve the intraocular pressure by paracentesis of the cornea.

In small round ulcers this may be done through the floor of the ulcer, but when the ulcer is large and irregular perhaps the regular operation will do better, and yet it has always been our custom to puncture through the floors of even these. Sometimes it is necessary to repeat the operation upon several successive days. The escape of the aqueous lowers pressure, relieves pain, favors healing and tends to prevent perforation of the cornea with its attendant sequelæ.

Perforation.—It frequently happens that the cornea is ruptured with the escape of the aqueous and prolapse of the iris. In other instances, and especially if the iris has been contracted with atropin, only the membrane of Decemet protrudes, showing a bulging of a thin transparent membrane. In such cases puncture the membrane and draw off considerable of the aqueous. With the diminished pressure the membrane will often return to its natural position. If there is complete perforation with protrusion of the iris, atropin or eserin, according as to whether the rupture is central or peripheral, should be pushed and at the same time efforts made to return the iris with a probe. If unable to return, grasp with forceps, pull out and remove with scissors as close to the cornea as possible. If the perforation has been large, a staphyloma will result in spite of any treatment.

In cases in which there is no protrusion of the iris, the opening may be closed by granulating tissue which may be so great as to grow beyond the level of the cornea and need removal. This condition is often spoken of as a staphyloma but is in reality granulating corneal tissue. The excess tissue can be removed with a knife or scissors.

Sequelæ.—No discussion of ulcerous keratitis would be complete without considering the sequelæ. The most common is the cicatrix shown by a dense white spot. The thicker and whiter these spots, the less remedial to treatment, but much benefit will often follow from massage with yellow oxid of mercury or other stimulating ointment. The massage should consist of lateral, vertical and radial movements, completed by circular ones over the closed lids following the application of the ointment and lasting from one to two minutes. We have had good results from daily alternating dionin with the above-mentioned ointments. Sometimes we use dionin for a few days or until the eye becomes immune to it and then use the ointment for a few days, following again with dionin. It is not possible to clear

up all these scars entirely, but it is possible to save the eye with little disfigurement in most cases.

Staphyloma.—The distention of a cicatrix to which the iris is attached is called a staphyloma. It is due to the fact that the scar tissue does not stand the intraocular pressure and consequently it is pushed forward. The treatment is preventive and has already been described. If the case is more severe than just to allow the prolapse of the iris, no treatment will avail and an enucleation is indicated.

Hypopyon consists of a collection of pus in the anterior chamber. It does not come from the cornea but from the vessels about the periphery of the cornea and ciliary body and iris. The only treatment is to evacuate the pus by paraceptesis of the cornea.

DISCUSSION

CHAIRMAN FLYNN: You have listened to a well-prepared paper on a subject that is very important to the small-animal practitioner. There is nothing that gives your client more worry than to see something wrong with his pet's eye. Particularly in keratitis of the cornea, when the animal is unable to see, the owner is very much worried and wants something done right away, and he is nearly always willing to leave the animal in the hospital indefinitely in order to get results.

Is there anyone who wishes to discuss this paper or ask any questions of Dr. Milks?

DR. QUITMAN: I should like to ask Dr. Milks whether I understood him right when he recommended the use of nitrate of silver in touching up the ulcers in the ulcerated keratitis.

DR. MILKS: We used that for years.

DR. QUITMAN: Don't you consider that a means of inducing a permanent opacity, inasmuch as you have formed in the cornea a silver chlorid that is absolutely insoluble, and no treatment you can give it afterwards will ever remove it? It is an absolute chemical law that you will get it. I have noticed it and I have seen it where cases have come to me from others. I have seen the silver chlorid opacity there; it is distinct; one can always tell it. It is a chemical law that you are bound to get a deposition in the cornea of silver chlorid which is insoluble in everything and absolutely impossible to remove.

DR. MILKS: Most of the chlorid is immediately washed out with the tears. That remaining in the ulcer is shed with the necrotic material. We have never caused argyrism with silver nitrate but have had it follow the use of some of the organic silver preparations.

DR. QUITMAN: Did you ever touch the ulcers, say, every day or every other day with tincture of iodin?

DR. MILKS: We do use some iodin but only for one or two applications.

DR. QUITMAN: Mercury ointment acts nicely in some cases, but nitrate of silver I don't approve of.

DR. MILKS: We have used it a number of years without causing a permanent silver stain. Many of the eye authorities recommend it and I believe Dr. Baker recommends silver nitrate for this purpose in his Theory of Practice. We haven't used it since we have used

the phenol because the phenol has given better results and the action is more prompt.

DR. QUITMAN: What did you mean by fluorescin?

DR. MILKS: Fluorescin is an anilin dye.

DR. QUITMAN: Anilin green?

DR. MILKS: It is a red dye that turns the cornea green. You can tell the progress of the ulcer pretty well. If you drop it in some morning and don't get any colorization, you know you have got it beaten.

CHAIRMAN FLYNN: There is another agent I find quite useful in cauterizing these ulcers; that is trichloracetic acid. If you use it, you must touch the ulcer and get away and not allow it to run over the surface of the cornea.

DAIRY COW NOW BIG FACTOR IN PROSPERITY OF OKLAHOMA

A recent map of Oklahoma indicating by marks of various shapes the location of cream stations, ice cream factories, creameries, pasteurizing plants, and combination plants, shows the dairy cow now as a big factor in the prosperity of the State. Formerly, on account of the cattle tick, such a development of dairying was impossible, but the antitick activities of the State and Government for the past six or seven years have resulted in the eradication of the pest from 43,255 square miles, or about 90 per cent of the infested territory.

As a result of these strides in eradication the figures on dairy production show large totals, and in 1921 milk and butter were important products. During that year 9,939,895 pounds of butter fat in the form of sour cream was produced, selling for a little more than $4,000,000, and 9,529,722 pounds of butter, valued at $3,240,000. More than 10,000,000 pounds of sweet milk was bought for making ice cream. Pasteurizing plants reported handling 62,261,983 pounds of milk. The figures are from reports received from 26 creameries, 44 ice cream plants, and 30 combination plants operating in Oklahoma or just outside its borders and buying from Oklahoma farmers.

Before the cattle tick was attacked in earnest dairying in the State was of very little importance.

GERMANY ADMITS AMERICAN CATTLE

A Berlin dispatch states that American cattle may now be admitted into Germany for immediate slaughter through the government stockyards at Duisburg and Meiderich.

EQUINE INFECTIOUS ANEMIA[1]

By R. A. KELSER

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DURING the past thirty years, equine infectious anemia, swamp fever, pernicious anemia or equine malaria, as the disease has been variously termed, has been reported at irregular intervals from different sections of the United States. For quite a period following the recognition of the disease in America the malady was known to exist only in Manitoba and, in the United States, in Minnesota. Subsequently, however, it has been reported from a third of the States in this country, including at present Washington, Nevada, Minnesota, Wyoming, North Dakota, South Dakota, Nebraka, Kansas, Missouri, Wisconsin, Oklahoma, Texas, Mississippi, Louisiana, Virginia and New York. Not being confined to any particular section or sections, the disease undoubtedly is even more widespread than our records tend to indicate.

In America the malady has been studied by Torrance (1),[2] Van Es (2), Francis and Marsteller (3), Mohler (4), Kinsley (5), Mack (6), Scott (7) and a number of others, and while our knowledge of the disease has been improved considerably as a result of the efforts of these and other investigators, we have by no means cleared all phases of the problem.

In November, 1921, the writer was ordered to Fort Robinson, Nebr., to investigate an outbreak of disease among the brood mares of the Remount Depot at that post, the malady proving to be infectious anemia. The history of this outbreak is briefly as follows:

Between April and November, 28 animals were admitted to sick report suffering from an obscure effection, which in the early part of the outbreak was diagnosed variously as anemia, septicemia, septicemia hemorrhagica, etc. With the exception of one case in a colt, the trouble was confined exclusively to the

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

[2] Numerals in parentheses after authors' names refer to list of literature at end of paper.

brood mares of the depot, a group of approximately 100 animals. The colts obviously were closely associated with the mares, yet only the one case occurred among them. Because the disease was thus restricted, and in view of the fact that these mares had been vaccinated against infectious abortion, the opinion was held locally that the vaccination was responsible for the trouble.

Of the 28 cases 15 had terminated fatally, 6 had been discharged and 7 were on sick report at the time of the writer's arrival at Fort Robinson. Of the 7 on sick report there was some doubt as to the diagnosis in one case. Several of the fatal cases were definitely known to be relapsed cases. Because the identifying numbers of the various animals affected with the disease were not recorded in the early part of the outbreak, it was impossible to determine definitely just how many of the affected animals were "relapses" rather than new cases.

SYMPTOMS

The symptoms manifested by the animals in this outbreak may be summarized as follows:

The animals appear greatly depressed, are extremely weak, the weakness in the hind quarters being an outstanding symptom. When forced to move the animal staggers. A rise in temperature to 103-104.5° F. was noted. In those cases which assumed a chronic character, the temperature gradually dropped to normal, followed in several cases by subsequent rises at irregular intervals. In those cases which ran an acute course the temperature remained high. The pulse was weak and increased in frequency, the most rapid noted in the cases examined by the writer being 60. There was marked inappetence during the febrile periods followed by a good appetite in the chronic cases without marked fever.

Examination of the conjunctivæ demonstrated them to be of a pale, "dirty pink" color. Small hemorrhages were noted on the conjunctivæ of several cases, and in a number of the cases similar hemorrhages were seen on the nasal mucous membrane. Some of the cases had a slight serous discharge from the eyes and nose. The anemic condition of the visible mucous membranes was marked in the chronic cases. Edematous swellings were noted on the head, lower extremities, in the sternal region and lower abdominal wall.

The blood of 5 chronic cases was examined by the writer. The red cell counts varied in the different cases between 3,250,000 and 4,300,000. The hemoglobin determination (using a Tallquist scale) varied between 45 and 70 per cent. Microscopic study demonstrated the presence of malocytes and microcytes. Scarcity of eosinophiles, a condition noted by a number of investigators, was an outstanding feature in the blood examination of these animals.

Urine specimens from two chronic cases were examined, a trace of albumin being found in one case while the other was entirely negative.

The writer had the opportunity to examine but one acute case. The red cell count in this instance was 6,125,000 and the hemoglobin determination 80 per cent. An analysis was made of a specimen of urine from this animal and a considerable quantity of albumin demonstrated.

The course of the disease varied from a few days to two and a half months, the exact duration, however, not being determinable because the animals were destroyed upon establishing the diagnosis of infectous anemia.

POSTMORTEM FINDINGS

At autopsy the carcasses were found to be greatly emaciated, except in the case of animals dying from an acute attack of the disease. The small amounts of fat present in some cases were generally of a yellowish tinge. Varying amounts of a yellowish or bloody fluid were found in the abdominal cavity in most instances.

Hemorrhages in the serous membranes and in the intestines, especially the large intestines, were found. These hemorrhages varied in size from that of a pea to as large as a silver dollar.

The liver in some cases appeared extremely pale, in others there was no marked change in color, but almost without exception they were extremely friable. The spleen was noted to vary in appearance from normal to three times its normal size and ruptured (see Figures 1 and 2). Petechiæ were noted on the surface of the spleen in several instances. The kidneys showed evidence of parenchymatous degeneration in a number of the cases, and in one instance small hemorrhages were noted under

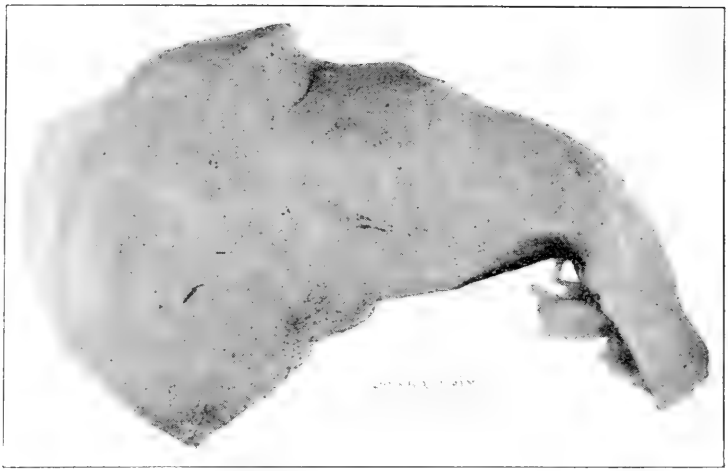

Fig. 1—Much enlarged spleen from case of infectious anemia, showing petechiæ on parietal surface.

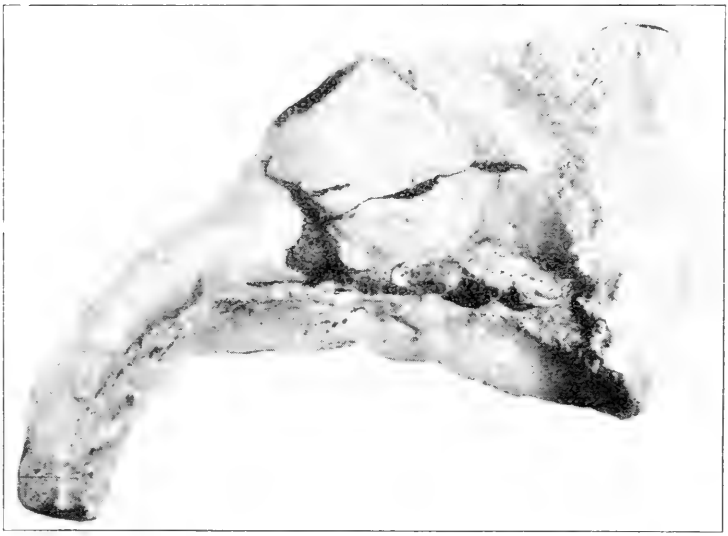

Fig. 2—Visceral surface of same spleen shown in Fig. 1, showing rupture which had begun to heal.

the capsule. The organs of reproduction appeared normal. A mild cystitis was noted in one case.

The lymph glands, especially the mesenteric, in a number of instances appeared swollen and of a dark red color. The lungs generally appeared pale and in a number of the cases showed

small hemorrhages, some being as large as a dime. Petechiæ were noted in the heart fat and ecchymoses on the endocardium.

Examination of the bone marrow of the long bones of the upper extremities, especially the femur, showed the spongy bone marrow of the proximal ends to be of a reddish color. The yellow fat marrow of the medullary canal contained dark red areas. This condition has been held by numerous investigators as a prominent finding in infectious anemia. This phase of the condition, however, was given subsequent study and will be discussed further along in this paper.

GENERAL CONSIDERATIONS

Fort Robinson takes in approximately 12,800 acres in addition to a good-sized wood reserve. It is located in the far northwest corner of Nebraska only a short distance from the Wyoming line on the west and the South Dakota line on the north. Two streams of water, White River and Soldier Creek, run through the reservation. The animal population at the time of the outbreak of infectious anemia was approximately 700.

The investigation of this outbreak revealed the fact that the brood mares and their colts had been pastured and sheltered separately from other horses at the post for about two years, except for an occasional mare brought in for work, in which case she was kept in a stall in a stable with other work horses.

Of four pastures utilized by the brood mares and their colts, two were bottom patures, consisting of approximately 50 acres each. One of these bottom pastures was admittedly the most boggy on the reservation, part of it being under water when inspected by the writer. It happened that, with one exception, no pastures over which the mares had grazed were used for other horses. The exception noted was an instance where the mares and their colts were temporarily turned into a large high and dry pasture of about 2,000 acres for about two weeks. This pasture was later used for other animals without detrimental results. Because of these conditions it was not surprising that the infection was confined to the group of brood mares.

Several of the animals which died of the disease were known to have been local purchases. Further, it was learned that a disease of horses, manifesting itself similarly to that encountered at Fort Robinson, had been more or less prevalent on several

farms in the vicinity. Thus, the disease appeared to have been introduced at Fort Robinson by one or more of these locally purchased mares.

Measures inaugurated with a view to eradicating the disease consisted of the prompt destruction of those cases on sick report and proper disposal of their carcasses. This was followed by thorough disinfection of the hospital buildings, stables, etc. The next step was to isolate those cases which could be identified as having previously been on sick report suffering from an ailment which, from the diagnosis, was suspicious for infectious anemia. There were 8 such cases. The remaining mares in the group were then given a thorough individual physical examination and those appearing at all unthrifty were isolated as a second group. The remaining animals were then isolated as a third contact group. Of the 8 animals with previous hospital records, all subsequently manifested symptoms of the disease and were destroyed. No new cases occurred among the remaining animals until just previous to the writer's departure for this meeting, when a report was received by the Surgeon General's Office to the effect that another case had occurred.

A review of the literature on infectious anemia shows a disagreement among various investigators on several important phases of the infection. Chief among these is the variation in views as regards the natural mode of infection. It has been conclusively shown that besides the blood, the urine of affected animals contains the virus of the disease, and until a few years ago natural infection was generally thought to be through ingestion of feed and water contaminated by affected animals. In 1914 the Japanese Commission (8) published the results of their four years and ten months investigation of the disease, and indicted the horsefly family (Tabanidæ) as the transmitters of the disease. They eliminated the stable fly (*Stomoxys calcitrans*) as a transmitting agent.

In 1919 Scott (7) of the Wyoming Station, in a paper presented before this Association at the New Orleans meeting, reported the results of his transmission experiments and named the stable fly (*Stomoxys calcitrans*), as well as Tabanidæ, as transmitting agents of the disease.

In the Robinson outbreak a number of the cases made their

appearance subsequent to the fly season. However, as previously indicated, it was impossible to tell how many cases were relapses rather than initial attacks. On the other hand, general conditions at Fort Robinson seemed to point more toward pasture infection than to insect transmission.

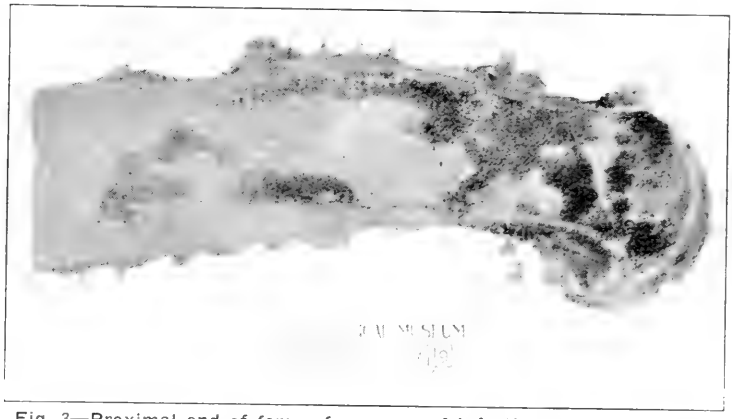

Fig. 3—Proximal end of femur from case of infectious anemia, showing condition of bone marrow.

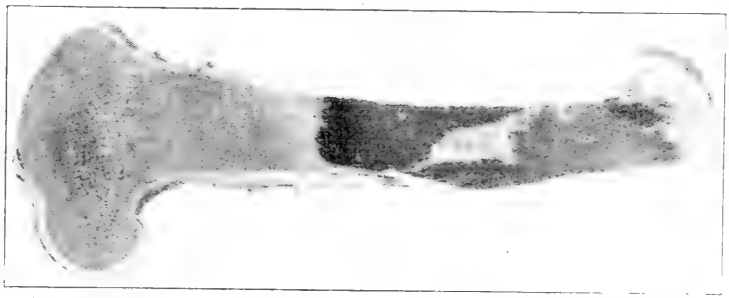

Fig. 4—Section through femur from case of infectious anemia, showing condition of bone marrow.

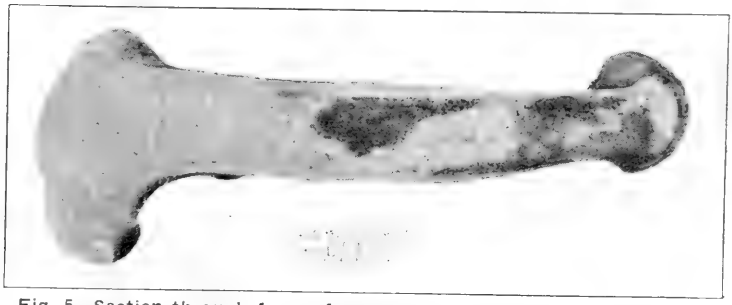

Fig. 5—Section through femur from case of infectious anemia, showing condition of bone marrow.

Another point which has been questioned in the last few years is the bone-marrow findings previously referred to. In 1915 Theiler and Kehoe (9) called attention to the fact that the marrow changes were not pathognomonic of infectious anemia. In 1919 Wright (10) reported his findings in this connection at the New Orleans meeting, and showed that "other disease conditions may give a bone marrow which is almost, if not quite, identical to that found in equine anemia." The writer has studied this phase of the problem and is in full accord with the findings of Theiler and Kehoe and those of Wright. Figures 3 to 8 show the appearance of the bone narrow in cases of infectious anemia, that in bones from horses that were destroyed because of general unthriftiness, and that of a horse which was destroyed because

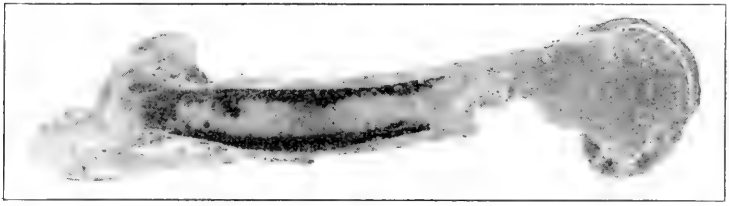

Fig. 6—Section through femur from horse which was destroyed because of general unthriftiness. Bone marrow indistinguishable from that in infectious anemia cases.

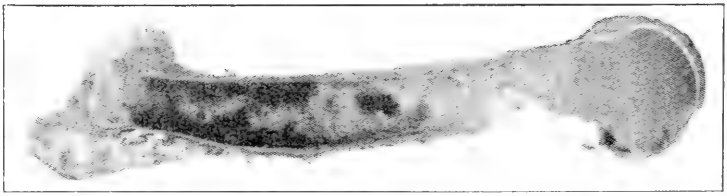

Fig. 7—Section through femur from horse which was destroyed because of general unthriftiness. Bone marrow indistinguishable from that in infectious anemia cases.

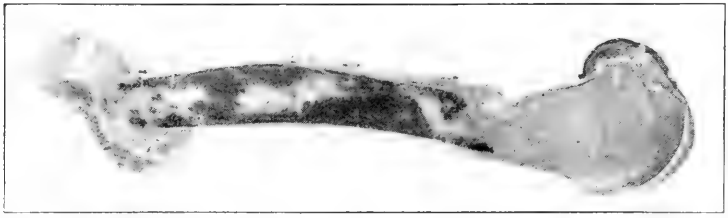

Fig. 8—Section through femur from horse destroyed because of chronic lameness. Animal was in excellent flesh. Bone marrow indistinguishable from that in infectious anemia cases.

of chronic lameness, the animal being in excellent flesh and condition otherwise.

CONCLUSION

In concluding these remarks it is desired to emphasize the need for continued study of this insidious malady. We need to know more about the nature of the virus. Our lack of knowledge of filterable viruses generally, of course, makes the problem an exceedingly difficult one. We pass material known to contain an infecting agent through bacteria-retaining filters, and if the specific disease can be produced with the filtrate the best we can do is to classify the etiological element as an "ultramicroscopic filterable virus." Here we must stop, the exact nature of the infecting agent remaining a mystery.

It has been suggested by several investigators that the virus of equine infectious anemia is probably protozoan. Without going into the merits of such a hypothesis, it is striking that the malady has many of the earmarks of a protozoan affection. The course of the disease, intermittent fever, recurrent attacks, destruction of red blood cells and the persistence of the infecting agent in the blood of arrested or apparently recovered cases for long periods of time, are certainly suggestive.

Finally, more definite and practicable means of diagnosing the disease would be of material advantage in the control of the malady. At present the diagnosis of the affection in individual cases, particularly in the beginning of an outbreak, is an exceedingly difficult proposition. Because of its insidious nature, it frequently happens that the disease is well established on a premise before its nature and infectiousness are recognized. Where the malady is suspected inoculation of a susceptible horse with blood from a suspicious case is of great value in establishing a diagnosis. In practice, however, such procedure, for obvious reasons, can not always be resorted to.

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DISCUSSION

DR. C. E. COTTON (St. Paul, Minn.): This very excellent paper, in my opinion, leaves not much room for discussion, but the point brought out in reference to diagnosis I think can not be given too much stress, particularly an examination before establishing a quarantine. I feel we should be very strongly impressed, before anyone makes a diagnosis, that he must have an autopsy.

We frequently find that our field men, in the northern parts of our State, will make a snap diagnosis without holding autopsy. Upon further examination, we find—particularly in the new territories—that the trouble is not due to infectious anemia, but is due to an infestation of parasites. These parasites may be the carriers of infection, but we have had no cases of infectious anemia being diagnosed without autopsy, and we found it due to parasitic infestation.

The point that Captain Kelser brought out, that you should inoculate an animal and produce the disease, is very, very important, and we agree that you must not make the diagnosis without inoculation, particularly if you have no history of the disease in that territory.

DR. CAMERON: I would like to ask Dr. Kelser if he attaches any particular importance to the enlargement of the spleen. In no case of swamp fever have I personally ever noticed any enlargement; in fact, very little pathological enlargement of the spleen.

Also in regard to the diagnosis: It is certainly important in the early stages. Where you get a chart showing the temperatures which are fairly characteristic, it is simpler. I have under observation

cases which no man could diagnose as swamp fever. They appear normal, but if their blood is taken and injected into other horses it will infect them. Those horses have been under observation since 1912. I feel it is an open question whether they are ever cured.

DR. HOSKINS: Along the same line, in regard to the findings in the spleen, I would like to ask Captain Kelser whether he noticed thrombosis of the spleen or thrombosis in any of the other organs, particularly the liver.

If I got all of the States mentioned in Captain Kelser's list, he omitted Michigan. Michigan should be included among the States where the disease has been found. It was diagnosed by Dr. Brenton some ten or twelve years ago, in southeastern Michigan, and several times since then, and proved by inoculation to be swamp fever. I have later intimate information regarding these outbreaks, and they point to the probability of being pasture infections in all three cases that have come to my notice.

DR. BUX: I would like to ask the gentlemen who have discussed this paper what they found to be the most satisfactory treatment.

DR. WATSON: I am not going to answer that question as to a satfactory line of treatment, because we have not found any, notwithstanding all the experiments made with that point in view. With regard to diagnosis, Dr. Cotton says we have only one method that is certain, and that is the inoculation of another animal. As Dr. Cameron mentioned, our investigations have been under way for twelve years. We have, from one lot of animals that were sent to us with swamp fever, cases where we inoculated a healthy animal and verified the swamp fever infection by reproducing it in healthy animals. The survivors of those animals are carriers of swamp fever infection today. Only a few months ago we took the blood of one of these animals that has been one of our best work horses, and his blood today is producing typical cases of swamp fever, ten years after recovery. How are you going to take measures of quarantine when we know that there are swamp-fever carriers that may be carriers for the rest of their natural lives? One of the objects of research work in swamp fever is to arrive at some method of diagnosis, because it is too expensive to inoculate a healthy animal every time; but there is no way to determine swamp fever without inoculation, and the horse is the only animal that I know of in which we can produce a definite swamp fever. That is the problem—diagnosis; treatment has failed.

I believe Dr. Cameron has mentioned that no method of treatment has proved satisfactory. We get a certain percentage of cases where recovery seems to take place after the treatment, but when you bear in mind that probably 50 per cent of those cases will recover without treatment, if the case is light, with any treatment you can employ there is no way of proving—except by incoulation—whether you have cured it.

CHAIRMAN REED: If there is no further discussion I will call upon Captain Kelser to sum it up.

CAPTAIN KELSER: Answering Dr. Cotton's remarks, we did make an examination of those cases that died of the disease, and we found a mild parasitic infestation among those animals. As Dr. Cotton has pointed out, infectious anemia is frequently associated with parasites, and so frequently in some cases, in certain outbreaks, that a number of investigators have been led to believe that it is actually due to parasites.

In answer to the question regarding changes in the spleen, that is not, so far as I have been able to find, a pathognomonic change or a characteristic change. Generally, in the acute cases, there was a mild enlargement of the spleen, varying up to this one case. The reason I showed that was because it was an exception; it was twice

normal size and ruptured. The acute cases showed mild swelling with hemorrhages, but in some of the chronic cases the spleen appeared normal.

In answer to Dr. Hoskins's question, I autopsied seven cases that died or were destroyed, and in the case from which the spleen was removed I could determine no evidence of thrombosis. In the other cases I made some special examination to determine that fact.

Regarding diagnosis: As Dr. Watson pointed out, it is impossible to diagnose the disease from any description or symptoms which you might find, or through any particular tests. The only test we have is the inoculation test. If you go into a community and the farmer has three animals and one was swamp fever, he is certainly not going to inoculate the others. That test can not be used except in large outbreaks, where it is a case of using one animal to save the lives of others.

The carrier proposition is very important. The case he mentioned of ten years is very interesting. In going over the literature I found a number that were shown to be carriers after four or five years, but ten years is longer than any I ever heard of.

I would like to ask Dr. Watson what his opinion is regarding the possibility of a protozoan infection. It does have some of the earmarks, especially regarding the persistence of the organism in the blood.

DR. WATSON: That question of protozoan origin in swamp fever has appealed to every investigator. I remember Dr. Rutherford, who was one of the first to diagnose swamp fever on this continent, used that as his first idea, and in every attempt we have made for years we have proceeded from the protozoan point of view. Of course, that Japanese work lent another supposition to it. Outside of the Japanese I do not know of anyone who has succeeded in demonstrating this protozoan in swamp fever, but there is no question as to the disease being apparently of a protozoan origin, after comparing the swamp fever sufferer over two or three years with certain protozoan cases that we know of. The fact remains, however, that we can not demonstrate any protozoan at present in swamp fever.

As the transmission of the disease might come into consideration, viewing it from a protozoan point of view, we know the fly theory, and apparently some cases are transmitted by flies. But when you come to put them in conditions where the fly could transmit the disease, you usually fail to reproduce it. I have nothing more to add. We are still looking for the protozoan, but we have not found it yet.

DR. HOSKINS: One remark on the probability of the correctness of the protozoan theory of this disease. I believe it is true that practically all protozoa are connected up or intimately associated with an intermediate host. The protozoa are not highly resistant organisms. As against the protozoan theory we have the knowledge that the swamp-fever virus is highly resistant. Several years ago, I took the blood from a case and dried it and pulverized it and kept it in a finely powdered state for approximately a year, at ordinary room temperature, and upon resuspending some of this powdered, dried blood in salt solution and injecting it into a horse it proved to be just as virulent as it had been a year previous. To my way of thinking, that hardly fits in with the protozoan theory.

DR. CAMERON: I believe this disease is not given the importance that it should have. The use of horses in the preparation of vaccine serums must be very dangerous, where a disease like this is not recognized, and it appears to be spreading all over the world. The possibility of the infection being transferred in these bacteriological products I think is very serious. In South Africa they take the precaution of not using any serum for horse sickness until it has

been stored for one year. This they believe excludes the possibility of the infection from swamp fever.

DR. HOSKINS: That point was brought out in the discussion of papers on swamp fever at the New Orleans meeting. At that time I related another experiment that I had made, which showed very conclusively that the preservatives which are used in commercial serums—that is, four-tenths per cent creosote or a half per cent phenol—will destroy the swamp-fever virus, whatever it is.

THE LAST RACE

An artist great has pictured Death upon a spectral steed.
I've looked that horse all over and don't think he has much speed.
So when I know Death's coming, ere I meet him face to face,
There's nothing I'd like better than to give him one last race.

Now, Tea Tray, pay attention when you hear the Great Judge call,
And come back to things terrestrial, to your old box stall.
I've got my racing saddle yet, and if you want to run,
I'm overweight—but you won't mind—once more we'll have some fun.

You were mighty temperamental, but when you were inclined
There was nothing could outrun you when you'd once made up your mind.
You'd often let the bunch away because of some queer whim,
Then you'd burn the track up after 'em, and generally you'd win.

Maybe that Death's a grim old sport and just twixt me and you,
I'll make a side bet with him and give odds of three to two.
About the track or weather I know you'd never care,
In heat or cold, in sand or mud, we'll race him anywhere.

Just think of what a crowd there'll be, for unless all guesses fail,
The sporting Shades from all the past will gather at the rail.
We'll run the race, and win or lose, I'll wave a last farewell,
Then, arm in arm, I'll walk with Death to where the spirits dwell.

N. S. MAYO.

The first number of *Michigan Veterinary News* made its appearance under date of November 1, 1922. It is issued by the Bureau of Animal Industry, of the Michigan State Department of Agriculture, and its function is to disseminate information of particular interest to the practicing veterinarians of the State.

BOT ANAPHYLAXIS[1]

By A. E. Cameron

Veterinary Research Station, Lethbridge, Alberta

FOR SOME YEARS information has been received of losses of range horses in Alberta in the early spring. In 1922, following the severe snowstorms at that period, reports indicate a heavy mortality. In one instance out of a bunch of 250 horses 50 head are said to have succumbed. The disease is known as "jiggers," no doubt from the nature of the symptoms exhibited. These are a trembling of the large voluntary muscles, especially of the hind quarters, followed by incoordination and death.

Unfortunately no opportunity for postmortem examination has presented itself, but where examination has been made by the ranchers they report this year a heavy infestation with bots. In one case the owner stated that the bots found in the stomach of a yearling would "fill a coal scuttle." Some of the deaths, where stockmen have been fortunate enough to observe them, were reported to be very sudden and apparently without previous abnormal condition being observed.

Dr. J. C. Hargrave, who forwarded this information, with the suggestion that some experimental work might be carried out, advanced the interesting theory that possibly the deaths were the result of anaphylaxis from the absorption of bot toxins. In the weakened condition that range animals are at this time of year and with the stomach empty from forced abstinence from food during the severe snowstorms, the sudden absorption of toxic products when the bots are in large numbers might account for the sudden deaths, while the less acute cases might produce the condition that stockmen term "jiggers."

This theory was based on the *Hypoderma* anaphylaxis in cattle reported by Hadwen (Journal of the A. V. M. A., April, 1917). Hadwen showed that animals subject to such a reaction were susceptible only to the species of parasite common to them and to which they had become sensitized; also that accidents causing injury to the parasites while situated under the skin of the back caused the anaphylactic shock in a similar manner to cases which had the *Hypoderma* larvæ extract injected into them.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922. Published by permission of Dr. F. Torrance, Veterinary Director General of Canada.

The theory presented by Dr. Hargrave is worthy of consideration, especially as in this particular year there is known to be a heavy infestation with bots.

At the Veterinary Research Station, Lethbridge, it must be assumed that all horses are infested with bots, as after a large number of postmortem examinations of horses, dead of different causes, none has been found free from these parasites. It was not possible, therefore, with the animals available, to have horses free from bots as controls. Cattle were used, and similar experiments were made on these as were carried out on horses.

The extracts were made from *Gastrophilus intestinalis* and *G. hæmorrhoidalis*. The larvæ of the former were obtained from the stomach of a horse, the latter from the rectum of horses still alive. The bots were snipped in small pieces with scissors and ground in a mortar. Normal saline solution (or in some cases distilled water) was added and the whole filtered through cheesecloth. When injected intravenously it was also passed through filter paper.

The dosage was arrived at by first weighing the bots and also weighing the cheesecloth or filter paper used. The crushed bots were filtered and then the cheesecloth or filter paper containing the residue was allowed to dry and then weighed. The weight of the residue was got by subtracting the weight of the cheesecloth and filter paper. The actual weight of the extract was the difference between the weight of the bots and that of the residue.

The doses given were comparatively small, as it was not desired to kill the horses experimented on. Several of the horses were infected with swamp fever, but apparently in good health. Most of the horses used are unbroken and live outside all the year.

Experiment 1

Horse No. 20 was isolated June 12, 1922, and food was withheld in order to get the stomach empty as would occur in a severe snowstorm.

On the 14th, at 10:36 a. m., the temperature was 99.6, when the horse was given a subcutaneous injection of 0.55 gram of bot extract (*Gastrophilus hæmorrhoidalis*), as calculated above, in 12 c.c. normal saline solution. Within a few minutes of being released from the "squeeze" was walking around in an uneasy manner. At 10:46 lay down and rolled, was biting the fetlocks and rubbing the head. Two minutes later was switching the tail and defecated. Up to 11 a. m. was uneasy all the

time, rubbing the body and head on the corral fence and walking constantly when not rubbing. The itching was severe, causing the horse to bite the legs, especially the fetlocks. There were colicky symptoms, lying down and rolling and when down rubbing the head and neck on the ground. Breathing had become fast and difficult. Up to 11:15 the itching continued, the head was shaken vigorously and occasionally yawning occurred. The respirations were about 70, but difficult to count, owing to the constant movement in rolling and biting all parts of the body. There was some saliva dropping from the mouth with a chewing motion of the jaws and licking of the lips. At 11:11 an urticaria was evident on the shoulders; this was accompanied by sweating in patches. At 11:20 easier with the breathing down to 40, although the itching continued. At 11:30 was placed in the "squeeze" and the rash could be felt all over the body. Released again, there was continual rubbing, champing of the jaws and some saliva dropped from the mouth. Up to noon dozing occasionally and quieter, with respirations down to 27. Temperature 101.2.

There was more or less restlessness until 3 p. m., when the eyelids were noticed to be swollen, breathing increased again to 80, although a horse in an adjacent corral was breathing 16. Remained dull until 3:20, when the rash appeared all gone. At 3:35 sweating increased, with large beads all over the body. At 4 p. m. mucus was dropping from the nostrils. At 4:15 was turned out to pasture, respirations 60, and looking miserable.

Twenty-four hours after injection the swelling at the point of injection in the neck was 3 by 4 inches, the horse otherwise apparently normal, temperature 100.8.

Seventy-two hours after injection the swelling was 8 by 8 inches, and like a typical mallein local reaction, tense and painful.

One hundred and twenty hours after injection the swelling was 2 by 2 inches, but appeared to contain pus. The swelling was opened and some pus evacuated.

On the third day after injection the temperature rose to 103.4 and returned to normal next day.

Experiment 2

Horse No. 28, a swamp-fever animal, had food withheld for 24 hours. On June 15, at 10:34 a. m., was given an intravenous injection of 0.4 gram of bot extract (*G. hæmorrhoidalis*) in 25 c.c. normal saline solution. Immediately on leaving the "squeeze" snorted a few times and defecated. At 10:35 was nodding the head and walking around straining to defecate and groaning all the time. At 10:38 uneasy, tail out, heavy breathing, grunting, and neighed once. Straining was severe, drawing the abdomen up and grunting. Liquid was dropping from the

sheath—probably sweat. Two minutes later there were strings of saliva from the mouth and the horse lay down, the rectum was everted and there was much sweat around the anus. At 10:42 the rectum was withdrawn again, sweat was dropping from the lower part of the body; there was heavy breathing and neighing occasionally. Passed gas and continued straining, drawing all the skin of the body into wrinkles. Sweating in patches and evidently suffering great pain. Up to 10:50 there was champing of the teeth; respirations were 45; gas was passed frequently, with heavy straining. Saliva reached to the ground; wrinkles showed on the skin around the nostrils and over the body; the sweat between the wrinkles emphasized them. Some manure was passed. Swaying gait; looked like dropping. The head was held near the ground. Up to 11 more manure was passed, with gas, accompanied with groaning and straining. Sweat was dropping from the body, champing the teeth, moving around slowly and kicking at the abdomen. Vertical wrinkles showed all over the body and saliva was still dropping from the mouth. Excessive straining, labored breathing, and hugging the corral fence. The expression was anxious, and this horse came right up to me, although a "broncho." To 11:10 straining was continued. Lay down. Mucus was discharged from the nostrils. Quiet for a few moments, then biting the fetlocks. Breathing was 40, with grunting and groaning. When lying down would rest on the sternum for a few seconds and then lie flat. The pain appeared to come on in spasms every few seconds. Up to 11:20 eyes half closed, sleepy looking at times; got up, staggered, and down again, half dropping. There was a mucous discharge from the anus. Shook the head up and down, drawing the head back and groaning. When down alternating from the sternum to flat out. When standing the nose was on the ground. Still hard straining, turned the head to the flank occasionally, breathing 42. No urticaria felt. To 11:40 very severe straining; looked as if going to die. Mucus had ceased coming from the nose and mouth. Had a very tired look and breathing labored. Winked the eyelids in a noticeable manner and champed the jaws. Respirations 40. Sweat drying a little. To 11:50 same symptoms continued. There was now bloody mucus from the anus. To 12:30 the same movements, and never rested long in one position. A considerable amount of gas was passed. Respirations fell to 36. A rash appeared on the chest at 12:07. In rising the hind fetlocks were knuckled like paralysis. More manure was passed, and when on the feet very rocky. Relaxation of the sphincter ani, with suction of air at each breath. The head was shaken and there was increasing loss of control, with swaying gait. To 2:15 lying down and getting up, with longer intervals on the feet, but still occasional groans and straining. Turned out to pasture at 2:45; rash all gone, the breathing 70, temperature 100.4. Appears

to be recovering. In moving off the hind legs were stiff, with a minimum of flexing of the hocks. Was eating until 4 p. m., and at 5 p. m. was standing in the shade of the trees.

This was altogether a most distressing sight, and an experiment one would have no inclination to repeat.

Experiment 3—Control

As a control and to show the specificity of the reaction, heifer No. 682 was given an intravenous injection of 0.4 gram of bot extract (*G. hamorrhoidalis*) in 12 c.c. normal saline solution at 1:41 p. m., June 15, 1922.

No disturbance appeared, except that from 1:45 to 1:55 there were some tears from the eyes and threads of saliva from the mouth. This was very little, but distinctly caused by the injection.

Nothing further occurred, and at 2:25 this heifer was chewing the cud peaceably. (While watching this process it was observed that the average number of times of chewing the cud was 40 and varied from 34 to 44.)

Experiment 4—Control

Cow "May" was given 0.25 gram bot extract (*G. intestinalis*) subcutaneously in the neck, June 18, at 6:30 p. m.

There were no symptoms or reaction whatever. The cow continued chewing the cud all along.

On June 19, there was no swelling at the point of injection, and none later.

Experiment 5

Horse No. 4 received 0.25 gram bot extract (*G. intestinalis*) subcutaneously in the neck at 6:35 p. m., June 18, 1922.

By 7 p. m. the conjunctiva was deeply injected. There were colicky pains, and the upper lip was extended, and this horse was rubbing and shaking the head. At 7:20 the upper lip was still being extended. The eyes were swollen like an eye reaction, mainly the lower lid. There was a profuse discharge from the nose and coughing. Sweating in patches all over. At 7:25 very labored breathing, quivering of the muscles of the thighs and shoulders and rubbing the nose. At 7:30 quivering of the muscles was very pronounced and continuous. Still sweating in patches. At 7:40 the large muscles still quivering. Breathing 28, of a sighing nature, and difficult. At 7:50 quivering still very pronounced. There was uncertain lifting of the feet; the expression was anxious, and the horse followed one around the corral, walking slowing most of the time and kicking at the belly occasionally. There was a slight rash on the shoulders and sides of the cheeks, but had to be felt to be noticed. The temperature was 97. At 8 p. m. was rolling, breathing 34, eyes half closed all the time and the muscles still quivering. By

8:25 there was a dirty discharge from the nose; the muscles were still quivering; the horse coughed three or four times at a time, and the upper lip was held out. The abdominal symptoms were slight, but were continuous from the start. At 9 p. m. looked easier and recovery seemed assured, but the breathing was very difficult; there was evidently edema of the lungs. The muscles were still quivering, but not so much. Turned out to pasture.

On June 19, the swelling at the point of injection was 1 by 1 inch and painful. June 20, the swelling was 2 by 4 inches. On June 22, there remained two small lumps of half an inch diameter each.

Experiment 6

Horse No. 7, a swamp-fever animal, was given subcutaneously in the neck 0.14 gram bot extract (*G. intestinalis*) which after filtration had been kept in boiling water for ten minutes. The injection was made at 10:15 a. m., June 20, 1922. By 10:18 the animal had defecated, was switching the tail, and breathing was 48. At 10:28 defecated again. At 10:32 breathing 60, but not labored. At 10:34 again defecated. At 10:42 respirations down to 40. At 10:47 was kicking at the belly and standing in a crouching attitude. At 10:55 was licking the lips and breathing 35. These symptoms were faint, but the breathing was much increased, with mild colicky symptoms. There was yawning and licking the lips occasionally. Two hours after injection appeared quite normal. On June 21, the swelling at the point of injection was 5 by 8 inches and painful. On the 23d, the swelling was 4 by 5 inches, not tense, and apparently not painful. This gradually disappeared.

Experiment 7

Horse No. 31, a swamp-fever animal, received subcutaneously in the neck 0.6 gram bot extract (*G. intestinalis*) which had been kept in boiling water for ten minutes. June 21, 1922, at 10:25 a. m. By 10:30 was rubbing and biting itself and licking the lips. The breathing at 10:35 was 20. To 10:54 was shaking the head and working the jaws, biting the knees and rubbing the face. The two horses injected together, No. 31 and No. 20, were biting each other on different parts of the body. To 11:20 continued shaking the head, biting the legs frequently, winking the eyelids noticeably and yawning. Breathing was 32 and the itching appeared to extend to all parts of the body. At 11:35 was standing quietly. Two small swellings were noticeable at the point of injection. Up to noon was occasionally scratching and biting, yawning, shaking the head and grinding the teeth. There was a rash down the side of the face and below the ears. Temperature 100.5.

At 1:45 was standing quietly and was turned out to pasture. On June 22, swelling at point of injection was 4 by 4 inches,

not very tense. On June 23, swelling 4 by 5 inches, softer, and not painful.

Experiment 8

Horse No. 20, which received a subcutaneous injection of bot extract (*G. hamorrhoidalis*) on June 12, 1922, was given an injection of bot extract (*G. intestinalis*), 0.6 gram, on the opposite side of the neck, at 10:28 a. m., June 21. At 10:30 was scratching the point of injection with the hind foot. At 10:32 was scratching the neck besides rubbing the head and biting the heels. At 10:35 was evidently itching all over. Up to 11:40 continued biting different parts of the body and legs, the latter especially. Occasionally shook the body.

This was a very mild reaction compared to the first, nine days earlier.

On June 22, the local swelling was 10 by 8 inches and painful. On the 23d the swelling covered the whole neck. This swelling went down and a central area came up with pus which was evacuated on the 25th.

An abscess formed subsequent to the injections on both sides of the neck in this horse, although none of the other horses nor the cow, which had subcutaneous injections, showed any infection.

While the foregoing experiments were being made the opportunity was taken of observing the reaction caused when the bot extract was placed in the conjunctiva. Again cattle were used as controls.

Two bots (*G. hæmorrhoidalis*) were ground in a mortar and 4 c.c. of distilled water added. After filtering, half of this was used fresh and the other half was held in boiling water for ten minutes. (The total amount of extract was 0.2 gram.) The fresh extract was used on horses No. 47 and No. 12. The heated extract was used on horses No. 1 and No. 2. All four horses were swamp-fever horses.

Experiment 9

June 16, 1922, horse No. 47 received 5 minims of fresh bot extract into the conjunctiva. This was administered with a glass syringe without the needle attached, at 10:15 a. m. At 10:20 there was slight lacrimation, and the horse defecated. At 10:50 the eye was more closed than the other. By 11:20 the lower eyelid was swollen. At 12:40 the whole eye was slightly swollen. At 1:45 the swelling of the eye was just noticeable.

This reaction would not have been read as a good eye reaction.

Experiment 10

Horse No. 12 received 5 minims of fresh bot extract as above, in the same manner as No. 47, on June 16, 1922, at 10:16 a. m. At 10:20 there were a few tears. At 10:40 the eye was more closed, with a slight mucous discharge. At 12:40 no apparent difference between the two eyes.

At 1:35 another 5 minims was injected into the conjunctiva. At 1:45 was rubbing the face. At 1:50 the eye was a little swollen. At 2 p. m. the area below the inner canthus was swollen. At 4 p. m. still a little swelling below the inner canthus, but not prominent.

This whole reaction was a very poor one.

Experiment 11

Horse No. 1 received half the bot extract which had been placed in the boiling water (this had a curdled appearance and was placed in the conjunctiva with the aid of a spatula) on June 16, 1922, at 1:20 p. m. By 1:30 the eyelids were swollen. At 1:35 the eyelids were both markedly swollen. By 2 p. m. there was a good diagnostic swelling. At 4 p. m. the upper lid was markedly swollen, the lower lid less so. This swelling went down gradually, and there was no trace of it on the following day.

Experiment 12

Horse No. 2 received the other half of the heated bot extract, as above, into the conjunctiva on June 16, 1922, at 1:22 p. m. By 1:30 the lower lid was swollen. At 1:35 was rubbing the eye, and both lids were swelling fast. At 2 p. m. the swelling had gone down a little and was not quite so pronounced as in horse No. 1, but was a good diagnostic swelling, the eye being half closed. At 4 p. m. there were marks of discharge and still a slight swelling. This gradually went down and there was no trace of swelling on the following day.

Both horses No. 1 and No. 2 were being worked and were observed only at the times given.

Experiment 13—Control

Two bots (*G. intestinalis*) were ground and 4 c.c. distilled water added. After filtration this was divided and half was placed in boiling water for ten minutes.

On June 17, 1922, heifer "June" received 10 minims of this boiled extract into the conjunctiva at 3:15 p. m. Up to 5 p. m. there was no trace of any disturbance.

Experiment 14—Control

On June 17, 1922, heifer "Molly" received 10 minims of the raw bot extract, the part of which, heated, had been given to the heifer "June." This was placed in the conjunctiva at 3:18 p. m., and up to 5 p. m. there was no trace of any reaction.

Experiment 15

Horse "Brownie" received into the conjunctiva 10 minims of raw bot extract (*G. intestinalis*), part of that used on the heifer "Molly," June 17, 1922, at 1:55 p. m. At 1:57 the membrana nictitans was passing across the eye frequently. At 2, the eye was kept closed a few seconds at a time. Two minutes later was rubbing the nose and eye, and some tears were falling. At 2:05 the lower lid was swollen. At 2:10 the eye was kept closed most of the time and tears issued from it. At 2:15 there was a localized swelling below the eye and the whole eye was swollen. At 3 p. m. there was marked swelling of the lower lid, but no tears. At 3:30 swelling started to go down. At 4 p. m., still noticeable, but going down fast. At 5 p. m. the lower lid still slightly puffed but noticeable only if carefully examined.

This was a good reaction.

Experiment 16

Horse No. 6, a swamp-fever animal, received into the conjunctiva 10 mimims of the boiled extract (*G. intestinalis*), as used on the heifer "June," on June 17, 1922, at 1:56 p. m. At 1:57 was rubbing the eye. By 2 p. m. was rubbing the nose and evidently uneasy and champing the jaws. The eye was kept closed and water was dropping from the corresponding nostril. Two minutes later tears were falling from the eye. At 2:05 both lids were swollen, the lower more than the upper. By 2:10 the whole eye was swollen and almost closed. At 2:14 there was a thread of saliva from the mouth. By 2:20 there was a distinct fold swollen along the upper lid. At 2:30 the eye was markedly swollen and by 2:40 there was more saliva from the mouth and occasional grinding of the teeth.

This reaction was much greater than that in "Brownie."

Discussion and Summary

While the experiments carried out would not admit of definitely associating the disease known as "jiggers" with the anaphylaxis produced by bot extract, at least one experiment brought out the characteristic symptom of the disease.

The lesions caused by bots in the stomach have been frequently observed by the writer to be quite extensive, the ulcer passing right through the mucous coat into the muscle, and in a case already reported (*Canadian Veterinary Record*, March, 1921) two bots were found adhered to the peritoneal wall of the stomach quite externally. Other cases are on record where the parasites have penetrated the stomach walls.

It seems probable that in a heavy infestation with bots enough toxin might be absorbed to produce anaphylaxis in a sensitized

animal. The fact that the animal is sensitized is proof of the absorption of bot toxin, so that cases might well arise during starvation or other causes where enough might be taken into the system to produce serious symptoms or death.

Colic symptoms are prominent in some cases, and bot anaphylaxis may well be an explanation of some obscure cases of colic.

The commonly prevailing idea that bots are harmless may, in any case, be refuted. The lesions found on postmortem ought to be enough in themselves to stimulate a more general effort to rid the host of these parasites.

The symptoms of anaphylactic reaction in the experiments carried out were mainly itching, with occasionally an urticarial rash, action on the bowels, and in one case extreme straining. The difficulty in breathing is no doubt the result of edema of the lungs. The manner of shaking the head would suggest an action on the brain. The whole reaction produced a decidedly tired look in the more acute cases.

There appears to be no doubt that larger doses would have produced death, as has previously been brought about by experimental intravenous injection of bot extracts (Ries, J. N., 1916, quoted by Hadwen).

Gastrophilus hæmorrhoidalis was not found to produce a greater reaction than *G. intestinalis*. In the experiments carried out a subcutaneous injection with 0.55 gram of extract of *G. hæmorrhoidalis* (Experiment 1) did not produce a greater reaction than a subcutaneous injection of 0.25 gram of *G. intestinalis* (Experiment 5).

The reaction is specific, as all control animals, cattle, showed no reaction excepting that in Experiment 3, where there was salivation and tears lasting for ten minutes, following an intravenous injection of *G. hæmorrhoidalis*.

Heating the extract in boiling water for ten minutes did not destroy the power of producing an anaphylactic reaction when injected subcutaneously. When introduced into the conjunctiva the reaction was greater in two horses given the boiled extract than in two given the raw extract.

If it were desired to use bot extract as a diagnostic agent the fact that it may be heated would insure that it could be kept free from bacterial action.

The eggs of three different bot flies (*Gastrophilus intestinalis, G. hæmorrhoidalis* and *G. nasalis*) were secured from horses at

the Veterinary Research Station, Lethbridge, July 4, 1922, which is earlier than the usual dates recorded. The fly *Gastrophilus intestinalis* was captured July 2. No special effort has been made to find the flies.

The writer desires to acknowledge the assistance received from H. L. Semans, Entomologist, Lethbridge, and A. E. Cameron, of Saskatchewan University, in confirming the identification of different *Gastrophilus* larvæ.

DISCUSSION

DR. FITCH: I don't think this paper should go by without showing our appreciation for its value. I am not familiar with what Dr. Cameron has called "jiggers." Is this a disease? We speak of "chiggers," meaning a little parasite. Is this a disease in Canada?

DR. CAMERON: Yes, it is a disease.

DR. FITCH: Will you please describe it?

DR. CAMERON: I explained that the disease is only known to us as "jiggers," and in some cases we find bots in large numbers, bots of horses. In some cases there are no symptoms, and in other cases for a short period the muscles are very noticeably affected; there is motion all over. On my way here, I might say, I met the first veterinarian who had considerable experience with this trouble. He stated that in all the horses on which he had made postmortem examinations he had noticed bots, but, of course, never gave them much attention. All those horses had considerable sand in the intestines.

DR. FITCH: I would like to ask one other question. I noticed in your paper that *intestinalis* produced as much if not more reaction than *hæmorrhoidalis*. What is the relative frequency of these two bots?

DR. CAMERON: The *intestinalis* is much more powerful.

DR. WATSON: I think this condition arises mainly from some special cause. The animal may have been starved for a period before the symptoms of this condition arose.

DR. CAMERON: The veterinarian with whom I discussed this subject said that most of the horses on which he held postmortem examinations had been driven.

Dr. Z. Strong was a delegate from Vancouver to the recent Liberal convention at Nelson, B. C. He succeeded in getting adopted an important resolution regarding adequate meat and milk inspection.

Dr. F. Torrance, Veterinary Director General, met several of the B. C. practitioners in the Health of Animals office in Vancouver on October 12 in friendly conference. Dr. Geo. Howell, President, B. C. Veterinary Association, brought up the subject of the practitioners assisting the department in export and accredited-herd testing, and also the employment of laymen to do livestock sanitary inspection.

PATHOGENICITY OF BACTERIUM SUISEPTICUS FOR HOGS[1]

By A. F. Schalk *and* L. M. Roderick
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THE POPULAR WAVE of animal diseases due to the so-called group of bipolaris septicus organisms, which have been so conspicuously in the limelight for many years, has recently experienced a rather sharp decline. Although we have neither desire nor inclination to discuss at length the more potent reasons for this marked subsidence, the fact remains that the more successful practitioners, the more searching clinicians and the more careful investigators of animal diseases have shown a much greater disinclination to use the term hemorrhagic septicemia so promiscuously as they have in the past.

That the prevalence of these diseases, with the exception of fowl cholera, has been greatly exaggerated and tremendously overdrawn before the public is now frankly acknowledged by a large number of their most enthusiastic supporters. Now, since the crest of the wave is apparently passed over, a tendency toward more sober and conscientious consideration is being shown on many sides. However, as in most lines of endeavor, where deliberate exploitation and premeditated propaganda are practiced, a marked reaction has set in. Among other ways in which this reaction has manifested itself must be mentioned the urgent demand of many serious-minded people, both breeders and sanitarians, for more definite light upon the subject, the status of which is now generally considered slightly short of chaotic.

Ever since the germ theory of disease became definitely established, we have been using some time-honored expressions in connection with infectious diseases. No discussion of such diseases would appear complete without conveying the idea that the course, extent and termination of the disease depends largely upon the "virulence of the organism involved" and the "resistance of the animal attacked."

Accepting these two measures as determining factors in infectious diseases, let us inquire what is the true measure of

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

virulence in the case of the bipolaris suisepticus germ with which we are dealing. With a large number of infectious diseases one can at least maintain and in some instances increase the potency or virulence of a virus by repeated passage through its natural host or some experimental animal. The rabbit appears to be ultrasusceptible to the suisepticus and serves as a means extraordinary for determining the presence or absence of this organism for diagnostic purposes. When these germs are injected intravenously or subcutaneously into rabbits, they just simply die, apparently regardless of the source, quality or quantity of the virus. It is not at all difficult to obtain any number of strains of this organism which will carry away rabbits within 8 to 36 hours. But inject these same apparently highly virulent strains into susceptible swine and they produce no injury whatever. Thus it would appear that if various strains of these organisms are of sufficient virulence to be of etiologic significance in inducing disease in large animals, they would be sufficiently virulent to kill rabbits in 12 to 36 hours. Those who have had considerable experience with such investigations are only too keenly conscious of the overwhelming majority of cases in which they fail to produce the disease in hogs.

When we turn to the other condition, the resistance of the animal, we are again confronted with a more or less immeasurable and undetermined factor. It is only too common usage for us to say that an organism, such as is represented by the suisepticus, which in nature leads a saprophytic existence, suddenly may become parasitic, assume pathogenic properties and produce disease, the result of lowered resistance. As to the real truth of this latter statement there is but scant absolute proof in recorded data. It is largely a matter of assuming and taking for granted, and the assumption is of such long standing that the idea of lowering resistance in various ways is accepted and not questioned.

Those who contend that hemorrhagic septicemia as a primary disease is of great economic importance in the swine industry attempt to explain their contention on the basis that the resistance of the animal is lowered in various ways and the suisepticus organism rises up from its saprophytic dormancy and readily attacks and invades the tissues, thus producing disease.

If this be true, it is quite reasonable to conclude that in the course of ordinary hog raising on the average farm at least

some of the "assumed resistance-lowering conditions" are sure to develop from time to time, causing the swine to contract hemorrhagic septicemia.

We have especially designed our experiments along the lines of "lowering resistance" in hogs, if possible, by grossly abusing their hygienic and sanitary conditions. We have not only attempted to simulate those breaches of hygiene and sanitation which are commonly encountered in the average hog-lot, but we have enormously exaggerated them to an almost ridiculous point in our endeavor actually to lower resistance so that they will become regularly susceptible to the suisepticus organisms.

This phase of work was undertaken because of the possibility that these organisms might be an etiologic factor of more or less significance in swine and because of a close correlation to our hog cholera investigations.

The suisepticus organisms used in the experiments represented a variety of strains from several reliable laboratories, as well as a few isolated from swine at this station. All strains obtained from outside sources were of swine origin as vouched for by the laboratories supplying them. Ordinarily several strains were used, grown in plain broth for 24 hours. All strains were carefully checked for cultural characteristics and only those conforming to the bipolaris septicus group were used. In the pathogenicity tests on rabbits all strains proved fatal for these animals within 8 to 36 hours. In addition to feeding the cultures as indicated below, in many instances the pigs were also given the entire skinned carcasses of the check rabbits which had died from the inoculations and were fairly swarming with the suisepticus bacteria.

The pigs used were ordinary grades and, with the exception of the wormy one, were in fairly good condition. They ranged in weight from 30 to 80 pounds and, with the exception of five or six, had not been given the serum-virus treatment.

Investigations relative to the susceptibility of hogs to the suisepticus organism and the feasibility of producing an infection with cultures may be grouped into six classes. We believe that infections occasionally produced by subcutaneous and by intravenous injection can have little relationship to infections which might arise under natural conditions. Consequently it was attempted to produce infection by feeding the organism.

Report of Experiments

I. Starvation rations plus insanitary surroundings plus feeding large quantities of suisepticus cultures.

Eleven pigs were used in this series of experiments. They were handled in groups of two or three with the work extending through two summers. It was attempted to lower their resistance by general neglect, so they were held in small houses. The manure was allowed to accumulate, and the rations were restricted to the starvation point. Such management was begun about a month before infection was attempted. They were then given in their feed mixed broth cultures of *Bacterium suisepticus*. Ten mils was usually used for each pig and given at intervals of one to three days for periods of about four weeks. Although ingesting such amounts of presumably virulent suisepticus bacteria and continually exposed to such infection in their pens, not a single pig showed any elevation of temperature or loss of appetite during the period of infected feeding. Further, these pigs were injected either subcutaneously, intravenously or intracardially at the termination of the feeding experiment with quantities (1 to 5 mils) of culture which killed control rabbits. They remained unaffected except for some transitory loss of appetite in certain instances.

II. Starvation rations plus exhaustion plus insanitary surroundings plus feeding quantities of suisepticus organisms.

Nine pigs in two groups were exercised by forced driving for a period of three hours until they were nearly exhausted. They were then fed on the meat of four rabbits dead of an injection of *Bacterium suisepticus*. This procedure was twice repeated, yet all pigs remained unaffected. Likewise five mils intracardial injections of culture produced no untoward results.

III. Pigs with opened wounds (castration wounds and opened abscesses on the heads) plus bedding and feed contaminated with these organisms.

These pigs were fed and cared for as usual and given seven infected feeds of various stock cultures, varying from 5 to 125 mils per pig. No disease symptom developed, nor did injections of culture at the close of the experiment induce disease.

IV. Normal pigs given highly alkalinized feed (sodium carbonate) plus feeding large quantities of culture.

These pigs were given four infected feeds of from 10 to 125 mils. Their feed was previously alkalinized with a solu-

tion of sodium carbonate. No disturbance whatever arose, nor did subsequent injections of 5 mils of culture produce disease.

V. Normal pigs plus sudden change to excessively high protein foods plus feeding large quantities of suisepticus bacteria.

Three pigs were changed immediately from usual feed to a high-protein ration comprised of tankage, cottonseed meal, middlings, alfalfa and oil meal. They were given at that time 100 mils of mixed broth cultures. This protein feed ration was continued for three weeks and then changed at once to the usual grain mixture and 850 mils of culture given in the feed. Nothing whatever unfavorable happened.

VI. Wormy pigs plus insanitary surroundings plus feeding large quantities of suisepticus organisms.

Four pigs were obtained from a farm where they were exposed to a severe Ascaris infestation. They were under observation for a month and given four feeds of 15 to 200 mils of culture each. Neither did this nor subsequent intravenous injection produce any disturbance.

It may be assumed that prolonged feeding such as has here been practiced may lessen susceptibility to infection. While such a possibility may exist, we were unable by any procedure to produce an infection except in one isolated instance by intravenous injection, a condition which probably has no parallel in nature. Six untreated pigs were injected subcutaneously with 2-5 mils of culture, two others were injected intranasally, yet no disturbance whatever could be produced.

There is little difficulty in isolating the suisepticus organism from the lungs of hogs which are affected with pneumonia. Spray (Journal of Infectious Diseases, vol. 31, p. 10) found *Bacterium suisepticus* in 168 cases or 54 per cent of the pneumonic lungs which he examined.

One might think that such a frequency of occurrence is indicative of the pathogenicity and causal relationship of the organism to the condition which exists. Examinations were made at this laboratory of the heart's blood and lungs of 19 hogs dead or killed following an infection with the virus of hog cholera. None of these pigs were exposed intentionally to suisepticus infection. Of these, 10 resulted negatively to rabbit inoculation both from the lungs and the heart blood. Of the remainder, 3 were positive with both heart blood and lung. Six were positive with only the lung. Six of the lungs which furnished cul-

tures showed more or less serious hemorrhagic or pneumonic involvement, while 4 appeared normal. It is quite apparent that the organisms could not have precipitated the hog cholera, most of the cases of which were inoculated, so it must be inferred that they were incidental and at most only aiding in the formation of lesions.

Summary and Conclusions

Extensive experiments have absolutely failed to produce any apparent infection in hogs by the use of methods hereinbefore described.

We are forced to the conclusion, therefore, from these experiments, combined with our routine laboratory examinations, that the pathogenicity of *Bacterium bipolaris suisepticum* for hogs is purely negligible. Such being the case, the occurrence of such infections in swine is rare indeed and furnishes little need for the use of swine plague bacterins. While their presence in the lungs of hogs, particularly those in which a pneumonic process exists, is accepted, we believe that their rôle in the production of disease is a minor one, that they are at most only accidental invaders which are enabled to multiply rapidly in a diseased area which may have been produced by some other injurious agency.

Such pneumonic conditions in hogs are frequently fulminating in character. It would appear that good hygienic and sanitary precautions would be far more efficient in preventing swine disease than the use of biologics which are prepared with suisepticus which is notably low in antigenic value.

At the request of the Jamaica Government, the British Colonial Office has sent Dr. Connacher, a veterinary expert formerly employed by the South African Government to combat the outbreak of foot-and-mouth disease, which is spreading in the western provinces of the Island.

The English Ministry of Agriculture has offered two research scholarships in veterinary science, each of the value of 200 pounds sterling per annum, for three years. The scholarships are open to candidates who have obtained the diploma of the Royal College of Veterinary Surgeons or who have shown evidence of proficiency in medicine or other relevant branch of science.

THE APPLICATION OF VAJDA'S METHOD TO THE EXAMINATION OF FOX FECES[1]

By J. A. ALLEN

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IN a recent communication Vajda (2)[2] described a new method for the quick and accurate examination of feces for the eggs of parasites. The basis of this test is that the specific gravity of the diluted fecal material is changed by the addition of glycerin so that the eggs ride on the surface of the liquid.

It is quite obvious that if this simple procedure were as efficient as the older and more time-consuming method, it would be to advantage to employ it, especially in laboratories where the examination of feces is a routine practice.

It is a function of this Station to make parasitic surveys for fox ranchers, and several hundred samples are submitted monthly. In order to find whether this irksome routine could be reduced, a series of tests were conducted to obtain comparative data between the standard centrifugal method and that adopted by Vajda.

In all our fecal work we have employed Pepper's technique as described by Stiles (1). Briefly stated, this method consists in mixing the feces in water, and after the heavier particles are removed, small quantities of the mixture are placed in tubes and centrifuged. The supernatant liquid is poured off, fresh water added, and the process repeated until the supernatant liquid in the tubes is comparatively clear.

Vajda's technique consists in merely mixing the feces, diluted with water to the proper consisteney, with varying quantities of glycerin, depending upon the kind of parasitic eggs sought. Thus for *Strongylus, Oxyuris, Dochmius* and *Œsophagostomum* eggs he recommends the addition of 1 part of glycerin to 1 part of the fecal mixture. Three parts of glycerin are added to obtain the eggs of *Ascaris marginata, Ascaris lumbricoides* and *Trichuris.*

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[1] Published by permission of Dr. F. Torrance, Veterinary Director General, and Dr. E. A. Watson, Chief Animal Pathologist, Health of Animals Branch.

[2] Numerals in parentheses after authors' names refer to citations to literature at end of paper.

Ascarid, hookworm and lungworm (*Eucoleus œrophilum*) eggs are those most commonly found in fox feces. Coccidia are also comparatively common. In a preliminary series of experiments it was found that ascarid and lungworm eggs were recoverable in greatest numbers when 3 parts of glycerin were added to the feces; hookworm eggs when 1½ parts were added. Coccidia could be readily detected when either 1 part, 1½ parts or 3 parts of glycerin were added.

In our series of experiments we selected thirty-two samples of feces, most of which were found by the centrifugal method, previously described, to contain the ova of either ascarids, lungworms or hookworms. Some of these samples contained coccidia which were not recognized until the sample was submitted to Vajda's test.

One gram of each sample was placed in waxed cones, made by folding 110 mm. filter papers in the usual manner and dipping them in hot paraffin. We shall explain later our reason for the adoption of these "one service" receptacles, which is a deviation from the technique of Vajda. Water was then added and the mixture stirred with a toothpick, a different toothpick being used for each specimen, until it assumed the consistency of a diarrheal stool. Fox feces vary so much in consistency that it is impossible to give any constant degree of dilution. Three such preparations were made from each sample; and to the first 1 part, to the second 1½ parts, and to the third preparation 3 parts of glycerin B. P., sp. gr. 1.26, were added. The mixtures were again thoroughly stirred and allowed to stand for one-half hour before microscopic examination. At the end of this time a clean, dry, solid glass rod was gently brought in contact with the surface of the mixture, and the glycerin droplets transferred to slides for microscopic examination. Care must be taken not to go below the surface of the liquid. After recording our observations, the mixtures in all three cones were centrifuged at about 1,200 revolutions per minute for 15 minutes, and microscopic preparations made as before. In no case did we have to change our diagnosis after centrifuging, though the process did concentrate the eggs or oöcysts of coccidia, so that they could be seen in every microscopic field. Indeed, in cases of fairly heavy infestations, hundreds of ova of uncinaria would be seen in a tiny droplet.

In order to record our observations so that they would have

some comparative value it was necessary to decide upon a system of notation. H+ was taken to indicate that hookworm eggs were so few that they could be found only with difficulty; H++ meant that hookworm eggs were fairly evident; while H+++ was taken to show that the eggs were so numerous that groups of them could be found in each microscopic field. In the accompanying tabulation L stands for lungworm eggs, A for ascarid eggs and C for coccidia. To include all our readings for every dilution, before and after centrifuging the glycerin mixture, would be too complicated for a table. We will merely strike a fair average for all dilutions, and compare the results obtained by the centrifugal method with those of the method proposed by Vajda.

Sample No.	Pepper's Centrifugal Method	Vajda's Method
390	H++	H+++
391	L++	L+
392	H+	H+++
393	L+	L++
394	H+, L++	H++, L++
395	H+++, L+	H++, L+
396	Negative	C+
397	H+	H++
398	H+	H+++, C+++
399	H++	H+++
400	C+	C++
401	A+	A+++
402	H+++, L+++	H+++, L+++
403	Negative	L+
404	"	H+
405	H++	H+
406	H++	H++
407	H+	H+++
408	H+, A+	H+++
409	H+, A++	A++
410	H+, L++	H+, L+
411	H++, A+	H+++, A+, C++
412	L+	H+, L+, A+
413	Negative	H+
414	"	H+
415	"	H+
416	L+++	L+++
417	A+	Negative
418	H+	H+
419	L++	L++
420	A+	A+
421	A++	A++

The foregoing experiments seem to justify the unqualified conclusion that Vajda's method for the detection of the ova of the parasites mentioned is at least as accurate as the centrifugal method. The technique is so simple, especially with our suggested modification, that the work may be done in the field, which is an important consideration in making determination in a large group of animals. When present in any numbers the eggs are concentrated so that much time is saved in arriving at a diagnosis, since one has not to look through a mass of débris in the search for eggs. Especially when the material is centrifuged this method should also prove a valuable aid in experiments devised to determine the efficiency of anthelmintics.

We have adopted the waxed cones because of the possibility of eggs adhering to the sides of tubes and other glassware when glycerin is used. In making a large number of examinations, particularly in the field, it is not always possible to see to it that all glassware is properly cleansed. The use of individual receptacles removes this source of error.

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2. VAJDA, THEODOR. A new method for detecting the eggs of parasites in feces. Jour. Amer. Vet. Med. Assoc., August, 1922, vol. 14 (n. s.), no. 5, p. 534.

LIVESTOCK IN RUSSIA

A heavy decrease in numbers of farm animals in Russia during recent years is shown in the following statistics issued by the Russian Liberation Committee:

	1914	1922
Horses	22,000,000	8,000,000
Cattle	18,000,000	6,000,000
Sheep	4,500,000	2,000,000
Swine	12,000,000	3,000,000

The Belgian Ministry of Agriculture has issued an order prohibiting the importation of ruminants from Argentina, Uruguay and Paraguay, because cattle from Buenos Aires have been found affected with foot-and-mouth disease on arrival at Antwerp, and because a large number of cattle of the same origin have been found affected with mange.

SOME ATTEMPTS TO CONTROL STRONGYLES IN ANEURISMS BY MEANS OF INTRAVENOUS INJECTIONS OF DRUGS

By MAURICE C. HALL *and* JACOB E. SHILLINGER
U. S. Bureau of Animal Industry, Washington, D. C.

ANTHELMINTICS as used to remove worms from the lumen of the digestive tract constitute a very old group of drugs, but it is only in recent years that successful anthelmintic treatments have been developed for worms outside of the lumen of the digestive tract, and at the present time there are comparatively few treatments of the sort which can be regarded as established. So far the best results have been obtained in the control of certain fluke infestations, notably the control of the common liver fluke, *Fasciola hepatica,* by means of the oleoresin of male fern, and the control of the blood flukes belonging to the genus *Schistosomum* by means of tartar emetic and of emetin. The attempts to control tapeworm infestation in portions of the body outside of the lumen of the digestive tract have been much less successful, and while claims have been published as to the destruction of cysticerci and hydatids by means of anthelmintics, various experimenters have failed to substantiate these claims and at present we have no well-established treatments for the destruction of cestodes in cases of somatic tæniasis. Apparently, better results have been obtained in the control of somatic infestations with nematodes than with cestodes, though less has been accomplished than with trematodes. Evidence that appears satisfactory indicates that the destruction of the Guinea worm, *Dracunculus medinensis,* will follow the injection of tartar emetic or of novarsenobenzol. The evidence in regard to the destruction of *Loa loa* is less conclusive, and that in regard to the destruction of the common human filarid, *Filaria bancrofti,* is distinctly contradictory and unsatisfactory as yet.

The measure of success which has been attained in the control of these worms outside of the lumen of the digestive tract in recent years warrants a certain degree of optimism in regard to the prospects of developing satisfactory treatments for many

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

of these worm infestations. Prolonged experimentation is almost certain to yield positive results in time. While the results which we have to report are mostly of a negative character, so little is known at the present time that it seems worth while to add even a small amount of information on this subject.

One of the nematodes in the group under discussion which is of most interest to veterinarians is *Strongylus vulgaris*, the strongyle which in its larval and agamic stages is responsible for the formation of verminous aneurisms in horses, asses and mules, the aneurisms usually occurring in the anterior mesenteric artery and its branches. These aneurisms are believed to be responsible for certain types of verminous colic and of intermittent lameness, and may lead to the death of the infested animal as a result of rupture of the aneurism and consequent fatal internal hemorrhage. While we believe that the repeated routine use of the chenopodium treatment for the removal of the adult strongyles from the large intestine is a measure of great value in controlling these worms and diminishing the danger from infestation with larval and agamic forms, it appears that a treatment for the destruction of the worms in the blood vessels would be a useful supplementary measure in the control of these worms, and we have accordingly carried out the following experiments with a view to ascertaining something in regard to the effect on these worms of drugs injected intravenously.

Three horses were used in these experiments, two of them being given intravenous injections of tartar emetic only, and one being given intravenous injections of tartar emetic and one injection of carbon tetrachlorid. The usual procedure was employed of shaving the hair over the jugular vein on the left side, disinfecting the shaved area (we used 5 per cent carbolic acid), and slowly injecting by means of a small needle to avoid the danger of bad results from shock. The protocols of the experiments are as follows:

Horse No. 232, weighing 900 pounds, was given tartar emetic daily in doses of 2 grains each for 4 days, then 4-grain doses for the next 3 days, and then 6-grain doses for the next 13 days, the drug being given in as small an amount of sterile distilled water as would dissolve it. On postmortem examination we found in the anterior mesenteric artery an aneurism practically devoid of thrombus and containing on its walls only a very small amount of material resembling a thick serum, the lining being otherwise smooth. Two worms were present, 1 dead, partly disintegrated, and more or less

embedded in the wall, and 1 alive and free, or almost free, in the lumen of the vessel. Both worms were so immature that an exact identification could not be made, but they appeared to be *S. vulgaris*, the worm usually present in these aneurisms.

Horse No. 233, weighing 750 pounds, was given tartar emetic daily in doses of 6 grains each for 13 days. On postmortem examination we found in the anterior mesenteric artery an aneurism which, as in the previous case, was practically devoid of thrombus and contained on its walls only a small amount of thick serous material. The walls were less thickened than usual and showed little evidence of recent irritation. Eight small worms, probably *S. vulgaris*, were present, all of them being alive.

Horse No. 234, weighing 825 pounds, was given tartar emetic daily in doses of 10 grains each for 3 days, then 15-grain doses for 3 days, and then 20-grain doses for 3 days. The day of the last injection with tartar emetic this horse was given carbon tetrachlorid, using the pure, undiluted chemical. When 4 c.c. had been injected the animal showed evidence of discomfort and alarm. On the injection of 1 c.c. additional he exhibited marked symptoms of weakness, lack of control, and intoxication, the symptoms soon subsiding. On postmortem examination the next day we found in the anterior mesenteric artery an aneurism containing a small amount of fibrinous thrombus. Three worms, probably *S. vulgaris*, were present, two in the lumen and one in the wall, all of them being alive.

A consideration of the foregoing protocols shows that horse No. 232 received a total of 98 grains of tartar emetic distributed over a period of twenty days; horse No. 233 received a total of 78 grains over a period of thirteen days; horse No. 234 received a total of 135 grains over a period of nine days, and also received a total of 5 c.c. of carbon tetrachlorid in one dose. Live worms were found in all cases, and in only one case, that of horse No. 232, was a dead worm found. This horse received the largest number of treatments, though not the largest total amount of drug. It can not be determined on the evidence obtained whether the tartar emetic used in this case was responsible for the death of this worm. The presence of live worms argues against the ability of the drug to kill the worms, but the drug might be able to kill the worms at certain stages of development, as at molting, and not at other stages. A large number of treatments might then be more effective than large doses. Other worms present during the period of treatment may have been killed and disintegrated. We examined the veins of the cecum for evidence of such worms but failed to find any. The horses tolerated the tartar emetic in the doses

used, but the animal given carbon tetrachlorid reacted very unfavorably, and the drug, as might be expected, is probably dangerous when given intravenously. It would be of interest to ascertain its value in killing horses when injected intravenously. Chloroform given in this manner is sometimes highly effective, quickly killing the animal when injected in amounts as small as 10 c.c., but at other times large doses may be administered with only the result of putting the animal to sleep.

There appears to be practically nothing in the literature in regard to the effect of drugs on horse strongyles in aneurisms when injected intravenously. We have seen a casual reference in a commercial house organ to the efficacy of sodium cacodylate injected intravenously for palisade worms of horses, but nothing is given to indicate whether this is for worms in aneurisms or in the intestine, and there is no evidence furnished on which to judge the claim that the drug is valuable.

The fact that the aneurisms in the cases of two horses were practically devoid of thrombus suggested that tartar emetic might have a beneficial effect in diminishing the amount of thrombus present, a result which would be of value in clearing an obstruction from the circulation and in lessening the amount of material which might dislodge from time to time and lodge as emboli. However, there was a certain amount of thrombus present in the case of the third horse, and we occasionally find untreated horses with aneurisms practically devoid of thrombus. It would therefore be necessary to carry on a large number of experiments to establish the value of tartar emetic in diminishing the amount of thrombus present, and for the time being we would reserve judgment on this point.

The Health Board of Lower Merion, Pa., has recently become associated with two neighboring boards in the employment of Dr. G. W. Grim, as milk control officer, at a salary of $3,500 per year, according to the *American Journal of Public Health.*

Dr. H. D. Martein, a practitioner in the city of Philadelphia for over 25 years, has been promoted from captain to major in the Veterinary Officers' Reserve Corps, and assigned to the 310th Field Artillery.

GASTROENTERITIS IN SMALL ANIMALS

(Discussion on paper of O. V. Brumley, at fifty-ninth annual meeting of the American Veterinary Medical Association. See paper in JOURNAL for November, 1922, page 200.)

CHAIRMAN FLYNN: Gentlemen, you have listened to a very interesting and instructive paper, well prepared and well presented. This is a subject that should be of a great deal of interest to all the small-animal practitioners, and I trust you will take an active part in the discussing of this paper. We know that gastroenteritis covers possibly 60 to 75 per cent of the cases that are brought to the small-animal practitioners.

DR. QUITMAN: Gastroenteritis in some form or another is an all-frequent disease coming to the veterinary hospital of small animals. Dr. Brumley, in his most excellent paper, touches a little short, I think, on the way of treatment, and in enumerating some of the specific ailments that may be mistaken perhaps for an ordinary type of gastroenteritis. There should not be any mistake, but canine typhus should be mentioned for differentiating purposes. Typhus commonly starts with vomiting and all that, and it is, of course, a very gross error to diagnose a case of typhus as an ordinary case of gastroenteritis or gastritis.

In puppies that are weaned I find one of the most common causes of gastroenteritis is a bread and milk diet—that is, white bread. It is a well-known fact that a dog is a carnivorous animal, and he does not take care of starchy foods as well as does the herbivorous animal. Dogs two months old, three months old, four months old, are continually brought to the hospital suffering from gastritis or gastroenteritis perhaps, and oftentimes by sizing up this poorly developed condition you can name the cause to the owner without asking any questions. It is a common thing for me to say, "You have been feeding this pup on white bread and milk, haven't you?" And I find I hit the nail on the head nine times out of ten. Sooner or later, from that white bread not digesting, from fermentation of it, and the keeping up of continuous irritation, a gastritis or gastroenteritis will develop.

In the way of treatment I agree in part with that laid down by Dr. Brumley, but to a considerable extent I would digress there. I fully agree with him that we should use every endeavor to ascertain the cause, but sometimes that being impossible, I don't believe in treating the ultimate inflammatory condition of either stomach or bowels. Aside from where specific antidotes are required in the nature of chemical poisons, or when chemical poisons are the cause, the treatment can be pretty well unified and in many cases showing intense pain will cease almost instantly upon the performance, as suggested by Dr. Brumley, of a gastrointestinal douche, frequently washing out the intestines. However, that fails in many cases, or many cases are too weak to stand that. When the dog is in a very weak condition the gastrointestinal douche is somewhat dangerous to perform. In puppies under two months old it is not safe, so that soothing medicines of a somewhat anodyne character are indicated. In my own practice I use a mixture of a quarter minim of phenol and 5 to 7½ grains of bismuth subnitrate, about 7 to 7½ minims of opii camphorata for soothing effect, and glycerin and cinnamon water. I find that to be a very efficacious mixture. Sulphate of iron is recommended by Dr. Brumley, in a mild solution. It is just a little harsh; it is apt to induce emesis, and perhaps we have been expending our efforts to check the emesis which is exhausting the vitality of the patient.

DR. J. P. SCOTT: I would like to have Dr. Quitman tell us some of the differentiations between typhus and gastroenteritis.

DR. QUITMAN: I made the reference in discussing a certain matter several days ago that while fully acknowledging the value of the microscope for diagnostic purposes, I have tried to elaborate somewhat on the value of the "nosescope" for diagnostic purposes in veterinary practice, and that is the veterinarian's nose, a very important feature for diagnostic means. It helps us to diagnose many ailments or differentiate many ailments. For instance, a well-known authority made the statement that practically every case of mange can be positively diagnosed only by means of a microscope, and I took issue with him, saying that for one having a dog practice and having to stop and make a microscopic examination would seriously retard the wheels of progress of his business. I told him that many old practitioners at least called in the help of their noses to differentiate whether it was eczema or a case of mange. It is the same way with canine typhus. There are several distinguishing features. I want to tell you the nose is the most accurate and the quickest diagnostic method that I could recommend for telling canine typhus.

The breath of a canine typhus patient has a distinctive characteristic odor. It is different from the foul odor of a badly inflamed stomach or where there is fermenting and perhaps decomposed food material in the stomach. It is a difficult odor to describe, but the fact of the matter is there are, you might say, two odors in connection with typhus. The characteristic odor is an intensely foul sort of a knock-you-down odor, and it suggests in its character somewhat that of a cross between diseased bone and pulmonary gangrene, if you can picture that to your olfactory organs. In fact, it has almost got to be experienced to be understood.

Then, however, in some cases of the peracute type of typhus, that kind that gets sick and will die within twenty-four hours, that odor may not have had time to arise, but the odor in that case is ofttimes —well, again I am up against it for a description; but it is a sort of a cadaverous odor, if you can imagine a cadaver that has reached a point giving off an odor and an effort has been made to deodorize it with chlorid of lime, without the chlorid of lime odor predominating, however. That occurs only in the peracute cases, however, if they die of acute septicemia before any pathological changes have time to occur.

In differentiating from gastritis and gastroenteritis, aside from the odor, there is a very great and rapid depreciation that comes on in typhus. That you may have to get from the history. In typhus the patient becomes prostrated very much more rapidly than it will in gastritis or gastroenteritis. That is a very important feature for differential diagnosis. Then the typhus case very frequently assumes a sitting posture, whereas the gastroenteritis case is restless, moves around more, tumbles around more, or in the case of Collie pups they are more apt to have their feet up in the air, but restless, nevertheless. Also in a typhus case they frequently have a peculiar, faraway look in their eye that sometimes calls for differentiation between typhus and rabies. There are other differentiating symptoms, but I believe those are the most predominating ones.

DR. RICHARDSON: Does the age of the animal enter into the diagnosis at all?

DR. QUITMAN: To some extent, but the old animal sometimes has it from constipation.

DR. RICHARDSON: Did you ever see typhus in a pup?

DR. QUITMAN: I have seen it in dogs six months old.

DR. H. J. MILKS (Ithaca, N. Y.): I have a little to add perhaps to the paper on gastritis. There are two or three things in the treatment that we differ a little bit on. For instance, we find dogs

that won't hold any treatment for a time; they vomit as fast as you get it to them. We find an anti-emetic necessary very often in those cases. Sometimes in those cases of persistent vomiting I use a cocain solution.

There are some other diseases in regard to diagnosis that have not been considered. One is vomiting. We have run against that particularly in neuritis and jaundice and peritonitis. In fact, we have had a few cases brought to us as gastritis, and it was simply neuritis that caused the trouble.

In regard to food, I have for years figured that the big thing in gastritis was to rest the stomach. If you give the dog food and water, he simply takes it down and it comes back again. He will drink almost always, and almost always he will vomit. Keep the food away, and also keep the water away, and allow a few laps at a time, or put a piece of ice in a leaky dish so he can get a little that way, but not enough to make him vomit.

DR. HOWARD W. MILLER: Dr. Brumley, in his paper, speaks of a contagious condition in cats. We have had that in central Ohio to such an extent that outbreaks of it have pretty nearly cleaned out entire catteries. So far we have not had any good results from any treatment we have followed out. I would like to know, Dr. Quitman, if under those conditions they have devised anything that will work; and also in outbreaks of infectious jaundice in puppies, have they devised anything? We have been working along that line in Columbus. Dr. J. McI. Philip has used an arsenic injection with which he has obtained results. Sooner or later the results of those experiments will be put in the magazines.

DR. QUITMAN: I would like to ask the gentleman a question in regard to those cats. Aren't they cats that are fed almost entirely on liver?

DR. MILLER: No, I can't say that they are. They are cats that are fed all kinds of things, cat foods.

DR. QUITMAN: Do you mean young cats?

DR. MILLER: Cats of all ages, females and so on. Some of our hospitals have been infected to such an extent that nearly every cat that comes into the hospital for an operation will recover from the operation all right and five or six days afterwards develop yellow vomit and so on.

DR. QUITMAN: Have you made a pathological examination? I have seen gastroenteritis, or apparently gastroenteritis, and on close examination we find it resembles scurvy, but you don't get erosion of gums in cats when they are fed exclusively on a liver diet, and perhaps getting a little milk occasionally, and that little milk will simply retard the coming on of the symptoms. That will occur and infect any number of cats. It is the same way if they are fed exclusively on salmon or any fish; sooner or later I find they come down with this scurvy-like disease.

DR. MILLER: This isn't a scurvy disease.

DR. QUITMAN: I don't believe I can answer the doctor's question any more specifically, except to find out whether he was alluding to liver poison or salmon deficiency. I might say I alluded to feeding white bread and milk to dogs. Any number of the laity have the idea that a cat should be fed on nothing but liver. Sometimes when you reprimand them for that they say, "Doctor, I cook the liver sometimes." They couldn't change from liver to something else. But liver alone or liver with milk will not and does not seem to be a balanced ration for the cat. The addition of milk to the diet will retard the oncoming of the symptoms. If cats have liver alone from the time they are weaned, they usually show these symptoms inside of the time they are about two or three months old. If they get a little milk occasionally at all, it will be delayed until the cats are

six months old. If they get milk regularly daily in addition to the liver, they will wait until they get one year or two years old, but they will come down invariably. The same applies to an exclusive fish diet. I have had considerable numbers of similar cases to those alluded to by Dr. Brumley and Dr. Miller, and I have always found them to be of a dietetic origin invariably. Of course their cases may differ from the ones I have been dealing with.

CHAIRMAN FLYNN: I believe the point Dr. Miller is endeavoring to bring out is the same point I am confident the essayist had in mind when he presented that portion of his paper relating to infectious gastroenteritis of cats. It is indeed a very serious problem, and when it starts in a small-animal hospital you just practically can't bring a cat to the hospital for any kind of an operation, or it will contract it usually within three days' time after being exposed, and death follows anywhere from twelve hours to three or four days. Sometimes old cats will stand it, will go through, but kittens from four months to a year of age last usually about twenty-four hours after they start to vomit this yellow vomit.

DR. MILLER: That is the condition exactly. I know there have been times in some of our hospitals when orders have been given that no cats at all will be accepted at the hospital for a period of sixty days, so as to clean up this condition, but it will run along for a while and another animal will come in and in a day or two will develop this trouble, and the hospital is infected all over again. It is a very serious problem.

This condition of jaundice seems to come from an infection carried by a flea bite, and whole bunches of puppies will slip away from you in a day or two. In fact, they get away from you before you recognize the jaundice in them, with just a slight tinge of yellow in the mucous membrane, and they die like flies.

DR. MILKS: This cat disease is not confined to large cities; it is on farms and in homes; but it does hit the hospital, of course. We have been through it and have had a good many pathological examinations made, and the nearest we can get to the cause is the colon group. I don't know if that explains the cause or not. We get letters from farmers frequently asking, "What can we do to keep cats. Every time we get a cat it dies."

Just to show you how infectious it is, one man had a cat on his farm and it died. He then got a cat from town and put it on the same place, had a veterinarian castrate it; the cat died. The next time he went back and got another cat; he had someone else operate on it, and that cat died. He brought the second cat up for examination, and I told him not to put another cat in that house for some time. He thought the two cats died from the operation, and the next time he got one he didn't have it operated on, and it died within the same time as the others. It is a serious thing. The poultry farmers have quite a time with rats, and so have other farmers, and they can't keep cats because of this infection. In some cases it works very rapidly. It isn't a kennel disease, because we find it in Ithaca long before we get it in the cat ward. We find it in a certain part of the town where a cat has only been sick a while before it dies, and in a day or two we get a cat in and it dies, and almost invariably it comes from the same part of town.

DR. E. J. FRICK: I would like to add a few more words to what Dr. Milks has said, and back it up with a little history. Three years ago I was working in New York City. The Bide-A-Wee Home in New York City has four or five cages about the size of this room, and they collect stray cats from all over the city, and have people bring cats and leave them there until they can find a home for them. In that home it was a common sight to see in one big case fifteen or twenty cats in all stages of depression, some dead and others sick

unto death; some of them just mopy, and some that had been brought in within a few days and were perfectly well. The Bide-A-Wee Home does not use any methods of destroying the animals. The home was originated to collect cats and keep them there until a home could be found for them. They do not have to destroy them because in a few days they die, or if someone comes and gets a cat and takes it home, the cat dies in a short time. The S. P. C. A. and the New York Women's League for Animals in New York have practically the same conditions, except the cats are not kept in such a large cage and it is not so severe.

In Manhattan, Kans., at the State College, for two years they have not seen a case of infectious enteritis in cats. This spring a farmer brought a cat in and the cat died. The farmer had seven other cats on his farm; all seven died. The neighboring farmers lost their cats. We brought in a cat that was sick and we isolated a *B. coli* culture and gave the cat a bacterin, and that cat is running around the laboratory at the Kansas State College.

As far as curative means are concerned, I don't know what we can do unless it is a matter of experimenting and trying to find some serum or bacterin or vaccine or something along the biologic line to control it. We have tried medicinal preparations and the cats all seem to go.

DR. RICHARDSON: May I say just a few words along the lines of vaccination? I went through this same experience that Dr. Miller has mentioned. We could hardly take a cat into the hospital without losing it through infection of this gastroenteritis of cats. The clinicians tried for a long time to overcome this condition by changing diet, by disinfection, by excluding cats from the cat ward for some time, and finally we in the Pathological Division undertook to make a bacterin. We made a bacterin, and in cases in which it was used at the time the cat came into the hospital, immediately upon its receipt, we had very good results. We used it as a preventive entirely. We are not fortunate enough to use it in all cases, and in a great many cases where it wasn't used until the cat had been in a day or so, or where it wasn't used until after the animal was operated on, we didn't get any results. I think from what I have seen and from what little experience I have had that a bacterin can be relied upon very well as a preventive of this condition.

DR. C. H. ANTHONY: I believe a great deal of this gastroenteritis is caused not from the home feeding but from mouse poison and poison the cat gets in the alley. I have found if you feed a cat twice a day nothing but raw beef you will never have any trouble with your cat. Probably once a week give him a little cream, or milk containing cream. An ounce or two of cream will satisfy him. Then give cold water for the balance of his drink, and keep all fish, salmon and everything of that kind away from him if you want to keep him healthy.

Dr. H. E. Biester has resigned his position with the University of Illinois and has returned to Ames to take a position in the Department of Research of the Veterinary School at Iowa State College.

Dr. J. Raymond Wells has left Falls Church, Va., and is now engaged in the Division of Sanitation and Health of Beaumont, Tex., as dairy and meat inspector.

CLINICAL AND CASE REPORT

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

POTASSIUM NITRATE POISONING IN CHICKENS, WITH A NOTE ON ITS TOXICITY

By JOHN E. GUBERLET

Parasitologist, Veterinary Department, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma

ON the morning of June 7, 1922, the writer had occasion to observe a flock of chickens suffering from poisoning, the symptoms of which were first observed by the owner on the preceding evening. Upon arrival several birds were found dead and 35 or 40 others were seriously affected, of which some were prostrate and others comatose. Those that were in a serious condition had a severe diarrhea with marked diuresis. The droppings were watery and contained large amounts of urate materials. The combs and wattles ranged in color from dark red to purple, or even black. Respiration was disturbed. The sick birds displayed great thirst and, if at all able to stand, were drinking water or trying to do so. Almost the entire flock of 225 birds showed discolored combs and displayed a great desire for water. There was a marked diarrhea and diuresis in the whole flock. Most of the birds showed no other ill effects and were taking food.

After inquiring of the poultryman as to what had been fed to the birds on the preceding day it was learned that they had been given a dose of Epsom salts (magnesium sulphate). The "salts," according to the poultryman, were given at the rate of three-fourths pound per 100 birds. It had been dissolved in water which was used in mixing bran mash. This was taken fairly readily by the birds. The owner insisted that the "salts" could not be responsible for the trouble, as he had treated the flock similarly on former occasions from the same box of salt, but "they didn't eat it as readily before."

Autopsy.—Skin very dark, subcutaneous blood vessels congested, flesh dark pink to red, blood almost inky black. The

lungs in most cases were extremely free from blood, while in some of the others they were hepatized. Liver severely congested and almost black. The veins of the liver were much enlarged and gorged with blood clots, while the arteries were extremely contracted. The kidneys were decidedly enlarged and highly inflamed. Crop and proventriculus severely congested; congestion beneath the lining of gizzard; enteritis and congestion throughout the entire length of the intestine. The mesenteric blood vessels were gorged with blood.

Further inquiry as to where the salt was procured revealed the fact that this was a consignment which had been purchased "at a bargain." This particular lot had been wet at the drug store and had been on hand for some time. The poultryman bought it for Epsom salts. A sample was taken to the laboratory for examination where it was discovered that the "salts" were not magnesium sulphate, but potassium nitrate (saltpeter).

Later conversation with the poultryman disclosed the information that at former administrations the salt was dissolved in the drinking water and given in that way instead of in a mash. On those occasions the birds would not drink much of the water. That accounts for the fact that no trouble was experienced at former treatments.

About 25 of the birds died during the days of June 7, 8 and 9. Some of the birds that were nearly prostrate had recovered by the morning of June 8, except that they were very weak. Some of the affected individuals lingered for two or three days before they died, and death in those cases was due to acute enteritis and nephritis. The entire flock apparently suffered to some extent from enteritis and nephritis for several days. This condition, however, did not interfere to any great extent with the activity of the birds, except that they displayed an unusual thirst and showed a decrease in appetite. Egg production was reduced.

Little is known concerning the toxic effects of various drugs upon fowls. The most important work along this line is that of Gallagher (1919), who conducted a number of very valuable experiments on chickens to determine the toxicity of some of the more important and commonly used medicinal agents and of poisonous substances to which fowls not infrequently have access. Kaupp (1917) and others give the dosage for nearly all of the

common drugs used in the treatment of fowl diseases but say little concerning their toxicity.

Saltpeter poisoning in fowls is not of uncommon occurrence, although not on as large a scale as shown in this instance. This salt is an important constituent of certain fertilizers, and chickens have been poisoned from that source. Many people often use this salt in the preservation and curing of meats, and poisoning from this source some times accidently occurs in fowls. It has been taken as a purgative by persons, being mistaken for magnesium sulphate (Holland, 1917, p. 218).

Potassium nitrate was formerly used rather extensively in medicine, as a diuretic, diaphoretic and febrifuge; also in acute cases of rheumatism. At present its use as a medicament is very limited, it being used principally as a local treatment.

Some experiments were conducted by the writer to determine what would be a toxic and a lethal dose of potassium nitrate for fowls. This was done because of the observance of such poisoning in a flock and on account of the interest this incident has incurred. Twenty birds, weighing 3 to 4½ pounds, were used in these experiments. Doses ranging from 1 to 90 grains were given by mouth and the results noted.

Very small doses, 1 to 2 grains, produced diuretic action with diarrhea in two to three hours provided water was near the birds constantly so that they could drink of it at any moment. This was especially true if the saltpeter was given in solution. In doses of 5 to 10 grains the same results were noted, except that the diarrhea and diuresis were more severe. Doses of 45 grains produced diuretic action in 40 to 45 minutes when the birds had constant access to water. Under these conditions doses containing 45 to 50 grains were toxic, and it required 80 to 90 grains for a lethal dose for fowls weighing 4 to 4½ pounds.

Chickens under range conditions, such as those in which the poisoning occurred, go considerable distances from their supply of water, and consequently can not drink at any moment they feel the desire. Therefore it seemed desirable that other experiments be conducted in which the birds would be given water about as often as they would drink under range conditions. Under this arrangement small doses produced no apparent external symptoms. Doses of 15 to 20 grains produced diarrhea and a diuretic condition after 2 or 3 hours, and then as a rule

only after the birds had taken water. Fowls taking 25 to 30 grains under these conditions showed toxic symptoms, while 60 grains was a lethal dose for a 3½ pound hen and 65 to 70 grains were fatal to birds weighing 4 to 4½ pounds.

Toxic doses of potassium nitrate produce symptoms of gastroenteritis, nephritis, muscular weakness, slow, weak pulse, depression of the circulation, disturbed respiration and slight hemolysis of the blood. Along with these symptoms occurs the congestion of the peripheral blood vessels which results in the darkness of the skin and discolored comb. This is followed by a subnormal temperature, paralysis, collapse, and coma, followed by death. In nontoxic doses it causes diuresis and diarrhea. The toxic effect of the salt is lessened by keeping the system flushed with water. Therefore in the experiments the birds which consumed large quantities of water threw off from their systems a large amount of the poisonous substance. Birds which had been previously fed on a highly concentrated protein diet, whose excretory organs had already been taxed, suffered more acutely and showed more prominent symptoms than birds previously fed on a low protein diet.

LITERATURE CITED

GALLAGHER, B. A. 1919. Experiments in avian toxicology. Jour. Amer. Vet. Med. Assoc., vol. 54, pp. 337-356.

HOLLAND, JAMES W. 1917. Medical chemistry and toxicology. 5th ed., 683 pp. W. B. Saunders Co., Philadelphia.

KAUPP, B. F. 1917. Poultry diseases. 2d ed., 245 pp. Amer. Vet. Pub. Co., Chicago.

Dr. A. K. Merriman, formerly of Latham, Ill., is now located at Sullivan, Ill., where he has purchased the practice of Dr. W. C. Bateman.

Dr. Joseph Hawkins, the oldest practitioner in the city of Detroit, has gone to California, where he will spend the winter with relatives.

Dr. J. G. Jervis, of Milner, B. C., has been appointed lecturer in veterinary science at the University of British Columbia, to succeed Dr. T. H. Jagger, who resigned.

Dr. A. W. Lehman has moved from Duncans, Vancouver Island, to Penticton, B. C.

ABSTRACTS

Epizoötic Lymphangitis. Brocq-Rousseu. Bul. Soc. Cent. Méd. Vét., Feb. 1922, p. 85. (Abst. in Rev. Gén. Méd. Vét., Sept. 15, 1922, vol. 31, p. 533.)

After long discussion as to the nature of the parasite of epizoötic lymphangitis, it is generally admitted at the present time that the pathogenic agent is a fungus, *Cryptococcus farciminosus*. According to recent work of the author, this vegetable parasite possesses organs of reproduction of different kinds:

1. Conidian forms, spores of dissemination;

2. Forms of vegetation and conservation, external spores and chlamydospores;

3. A budding or encysted form, the cryptococcus as found in the lesions.

The arrangement and form of the conidia permit the placing of this fungus in the genus Botrytis. Numerous species of the genus Botrytis have been classified in the following groups: Oömycetes, Ascomycetes, Basidiomycetes; but the agent of epizoötic lymphangitis could not be classified with certainty; all the attempts made in that respect have been without value, as they did not rest upon any precise fact.

It has been demonstrated that the conidian form develops best at a temperature of 20 to 25° C. This fact explains why lymphangitis exists in the endemic state in the warm countries of Northern Africa. There the fungus, under the form Botrytis, lives on natural media, such as straw, manure, etc., and the transfer of the spores to the affected animals is accomplished by the intermediary of insect carriers which are yet to be discovered.

The best method of finding the parasite in the lesions is to examine fresh preparations of pus without staining. With the usual stains, Ziehl or lactic blue, only the membrane of the envelope is stained; there is no elective staining. The examination of preparations of fresh pus does not permit the conclusion that only the cryptococcus is present; it is necessary always to obtain a culture. By this means there are found rather often the Priesz-Nocard microbe, streptococci, staphylococci, etc. The

prognosis of the affection varies in gravity according to whether the cryptococcus is alone or associated with other microbes.

What is the best remedy to use against well-defined epizoötic lymphangitis not associated with other microbes? All the surgical methods and all the medicaments employed have resulted in cures.

According to experiments made in the army, the vaccine prepared by Boquet and Nègre has given the most cures. Of 246 animals treated there were 146 cures, or 59 per cent, and 38 showed improvement, a total of 184 cases (74 per cent) cured or well on the way to recovery. This vaccine therefore appears at the present time to be the preferable method for the treatment of epizoötic lymphangitis. The only disadvantage of this treatment is the length of time that is sometimes required.

CATS AND HUMAN DIPHTHERIA. W. G. Savage. The Journal of Hygiene, vol. 18 (1922), no. 4, p. 448.

Bacteriologic examinations were made of nose and throat of eight healthy cats and 12 kittens not associated with any cases of human diphtheria. In 3 of the cats no bacilli were found which might be taken for Klebs-Löffler organisms. In each of the 5 remaining cats there were recovered bacilli which showed an extremely close resemblance to diphtheria bacilli, but all of which were definitely not true diphtheria bacilli. All the 12 kittens failed to show any bacilli which at all resembled diphtheria bacilli. A study of 5 cats which were closely associated with diphtheria cases failed to show that any of the animals had diphtheria-like lesions and with the possible exception of one case, none of the cats harbored Klebs-Löffler bacilli. In the one case, organisms were found which resembled the diphtheria bacillus and agreed with it for the most part in cultural characteristics. However, a guinea-pig inoculated with a very heavy dose of culture was unaffected. In experiments with young kittens, it was found impossible to infect them by throat swabbing, although very massive doses were used. Kittens in whose throats an artificial nidus for local growth was provided by chemical or mechanical means failed to develop diphtheria or any local lesions when mixed cultures direct from human throats were used. Not only did the bacilli not infect, but they failed to survive, invariably disappearing

after as short a period as 24 hours. Attempts to infect the nasal cavities of kittens were all unsuccessful and all feeding experiments failed.

The author is of the opinion that the common and widely accepted view that cats can suffer from a naturally acquired disease caused by the diphtheria bacillus is entirely without foundation. L. T. GILTNER.

THE VITALITY OF TRICHINÆ IN AMERICAN BACON AND HAMS. Erick Süsskind. Ztschr. Fleisch u. Milchhyg., June 15, 1922. (Abst. in Rev. Gén. Méd. Vét., Sept. 15, 1922, vol. 31, p. 517.)

In order to obtain exact data on the dangers presented by hams and bacon of American origin, Süsskind conducted a series of experiments concerning the vitality of trichinæ. Fifteen guinea-pigs were fed with ham and bacon heavily infested with trichinæ and well salted. The number of trichinæ consumed by each guinea-pig varied between 9,900 and 27,902. On autopsy not a single trichina could be found in the musculature, although the muscles which are the preferred seat of trichina infestation were subjected to minutious microscopic examination.

The results prove that the trichinæ in heavily salted American hams are dead and harmless, even if their capsules do not show calcareous infiltration. None of the hams and bacon showed calcified trichinæ.

The author then studied the influence of sea salt on muscle trichinæ. Pieces of guinea-pig muscle 2 centimeters thick, containing trichinæ 6, 8 and 10 weeks old, were subjected to mild and strong curing, 5 and 10 grams respectively of sea salt being used for 100 grams of muscle. These pieces of muscle, refrigerated at a temperature of 3 to 4° C., were removed on the third, seventh, fourteenth, twenty-first, twenty-fifth, thirtieth and thirty-fifth days of curing and fed to guinea-pigs and mice. The strong curing destroyed the vitality of the trichinæ at the end of seven days. The mild curing required three weeks to destroy the vitality of the parasites.

The results prove that the use of sea salt is the method to be preferred for preventing the infestation of man by products of American origin.

GRASS DISEASE AND BOTULISM. J. B. Buxton. Vet. Jour., vol. 78 (1922), no. 562, p. 125. (Abst. in Expt. Sta. Rec., vol. 47, p. 186.)

This paper relates to a well-known disease of equines in certain parts of northern England and Scotland which was first investigated by a special committee in 1918. The symptoms of this affection appear to be identical with those of so-called forage poisoning of horses and cattle in the United States, and an organism indistinguishable from *Bacillus botulinus* was recovered by Tocher at Aberdeen early in 1919 from diseased portions of intestine and from the spleen of several cases of grass disease. The author's investigations which followed resulted in finding that the blood of several horses which had recovered from the affection contained traces of botulinus antitoxin, type A, and that its presence was undetectable in the blood of more than 40 normal horses which were similarly tested. It was found that such blood contained complement-binding antibodies for *B. botulinus*, and that these antibodies did not show the same specificity for the homologous type as did the antitoxin.

THE PROBABLE IDENTITY OF THE CHITTENDEN-UNDERHILL PELLAGRA-LIKE SYNDROME IN DOGS, AND BLACKTONGUE. G. A. Wheeler, J. Goldberger and M. R. Blackstock. Pub. Health Rpts. (U. S.), vol. 37 (1922), no. 18, pp. 1063-1069. (Abst. in Expt. Sta. Rec., vol. 47, p. 285.)

Attention is called to the striking similarity between the blacktongue disease of dogs and the pellagra-like syndrome produced by Chittenden and Underhill in dogs by feeding a diet of boiled peas, cracker meal, and cottonseed oil. A review of the literature on blacktongue is given, together with postmortem findings in two cases. It is suggested that further investigation of this disease in dogs and a trial of the efficacy of a strictly dietary treatment are of importance on account of the probability that blacktongue in dogs may prove the analogue of pellagra in man.

An advertiser in the Cooperstown (N. Y.) *Otsego Farmer* offers for sale "200 year old White Leghorns in laying condition." And the following advertisement appears in the New Haven (Conn.) *Register:* "For Sale—A 3-year-old female billie goat."

REVIEW

Canine Distemper, Its Complications, Sequelæ, and Treatment. Hamilton Kirk, M. R. C. V. S., Fellow of the Royal Society of Medicine, Captain Royal Army Veterinary Corps. Published by Bailliere, Tindall & Cox, London, 1922. Price 10/6.

The first book dealing exclusively with the subject of canine distemper has just been published. It contains 226 pages, 28 text figures, and 1 plate, and covers exhaustively every detail concerning our present knowledge of this most prevalent disease of our canine friends. An indication of the subject matter treated is shown by the titles of the twelve chapters, which include the History; Susceptibility; Etiology; Bacteriological Notes; Predisposing Causes; Sources of Infection and their Practical Avoidance; Preventive Inoculation; Symptoms, Course, Progress and Mortality; Morbid Anatomy; Differential Diagnosis; Treatment and Convalescence. In addition there are an appendix and a bibliography.

Captain Kirk, who is a canine specialist, has presented the various etiological theories, discussed the latest suggestions of preventive inoculation, and in fact has covered all the various aspects of the subject in an unusually clear and readable form. It should therefore prove of value and assistance not only as a book of reference for the practitioner, but also as an interesting and understandable work for the student. As stated by the author, this disease has never received the consideration which no doubt would have been given it were it transmissible to human beings or food-producing animals, or were it associated with a heavy monetary loss to the country.

Both the author and the publishers are to be congratulated for the excellent manner in which they have performed their task; the illustrations are clear; the paper and binding are of good quality, and undoubtedly the book will shortly be found in the libraries of our leading veterinarians.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the November* JOURNAL.)

TUESDAY AFTERNOON, AUGUST 29, 1922

REPORT OF COMMITTEE ON BOVINE TUBERCULOSIS

PRESIDENT KINSLEY: Next will be the report of the International Committee on Bovine Tuberculosis, by Dr. Kiernan. (Dr. J. A. Kiernan read the report, which follows.)

Your committee pursued its studies of animal tuberculosis during the past year, stimulated at all times with an ambition to contribute some small particle of knowledge to supplement the classic report rendered to this Association at its forty-seventh annual meeting in 1910 by the first International Committee on Tuberculosis and the subsequent reports of high character made by the succeeding committees. All new information on the subject aids in the prosecution of the campaign for the eradication of tuberculosis of livestock which is being vigorously waged in the forty-eight States that comprise this Union, in the Dominion of Canada, also in the Republic of Mexico, which is taking a considerable interest in tuberculosis of livestock.

EXTENT OF BOVINE TUBERCULOSIS IN THE UNITED STATES

Your committee has made a thorough analysis of the information available, as a result of the cooperative campaign which has been in progress in the United States since 1917, for the purpose of reporting on the incidence of bovine tuberculosis in the respective States. We are now in a better position than at any previous period to indicate the extent of the disease in the various States. For five years there has been pursued with more or less vigor in the respective States a campaign which has for its objective the ultimate suppression of animal tuberculosis. That progress has been made during that period is quite evident, but of almost equal importance is the knowledge that has been acquired of the prevalence of the disease, its location and the extent of the infection. With this knowledge we are in a position today to take an inventory of the total healthy and total tuberculous cattle in every State. In consequence a fair outline may be made for a program which contemplates the eradication of the disease within the respective commonwealths.

The study made of the incidence of bovine tuberculosis shows that within 1,665,641 square miles in 37 States, and representing 46.2 per cent of the area of the United States not more than 1 per cent of the cattle are tuberculous. In that area, according to the census of January 1, 1920, there were 28,307,648 cattle, representing 41.2 per cent of the total cattle of the United States. To recapitulate, in 46.2 per cent of the area of the United States having 41.2 per cent of all the cattle, bovine tuberculosis exists to not more than 1 per cent,

EXTENT OF BOVINE TUBERCULOSIS
IN UNITED STATES
May 1, 1922
Approximate Extent
One Percent Or Less
More Than One, Not More Than 3%
" 3 " " " 7
" 7 " " " 15
" 15%
Total No. Mi.
1673,856
780,664
952,627
143,627
53,734
3,604,702
No. Mi.
464
217
264
40
15
1,010.
Total Cattle
23,338,254
17,458,566
12,397,446
7,590,487
2,960,454
66,771,706
% Cattle
41.2
25.4
18.1
11.0
4.3
100.
% T.B.
0.6
2.1
4.4
10.4
26.0
4.0

and in many parts of that vast area the disease exists to a degree considerably less than 1 per cent. The livestock owners of those States have expressed themselves in language which can not be misunderstood that bovine tuberculosis shall be eradicated from their herds and that infection must be prohibited from being introduced. They favor the rigid enforcement of regulations requiring the proper inspection and tuberculin testing of herds—not merely individual animals but herds from which individual animals are shipped interstate. The owners in those States have such a strong antipathy toward tuberculosis and are so actively engaged in its suppression that probably within ten years the disease will be either entirely eradicated or reduced to a minimum.

The accompanying map and table show the per cent of bovine tuberculosis as it exists in the various States.

EXTENT OF BOVINE TUBERCULOSIS, May 1, 1922

Approximate Extent of Bovine Tuberculosis	Total Square Miles	Per Cent of Total Area	Total Number Cattle Jan. 1, 1920	Per Cent of Total Cattle	Per Cent Tuberculous Cattle
Not more than 1 per cent ...	1,665,641	46.2	28,307,648	41.2	0.6
Over 1 and under 3 per cent..	763,979	21.2	16,828,916	24.5	2.1
Over 3 and under 7 per cent..	965,705	26.8	12,196,003	17.7	4.9
Over 7 and under 15 per cent.	155,638	4.3	8,478,185	12.3	10.3
Over 15 per cent.....	53,739	1.5	2,960,954	4.3	26.0
Total (United States).....	3,604,702	100.0	68,771,706	100.0	4.0

The committee is of the opinion that the livestock interests of the country are desirous of obtaining some idea of the extent of the job that has been undertaken. They have been patient in waiting for data on the subject, as indicated by the numerous requests that have been received for information as to the probable number of tuberculous cattle in the country and the approximate cost of suppressing the disease. The map furnishes the best information available as to the extent of the disease. This information was obtained from the livestock sanitary authorities of the various States and the Bureau of Animal Industry representatives cooperating within the respective commonwealths.

Since the inauguration of the cooperative campaign in 1917 much has been done educationally to convince cattle owners that tuberculosis may be eradicated from a herd or from groups of herds through the various methods of tuberculin testing, followed by proper sanitary precautions to prevent reinfection and by eternal vigilance of owners in keeping animals of unknown health away from their herds. That the educational feature of the work has produced results is shown by the very general knowledge of the subject possessed by livestock owners. The accredited-herd plan and the area plan of eradicating tuberculosis are quite well known in livestock circles in all parts of the country. This in itself is a matter that is worthy of considerable consideration—that this information has been disseminated so widely in such a comparatively short time.

We feel confident that inasmuch as it has been demonstrated to the satisfaction of the livestock owners of the United States that bovine tuberculosis may be eradicated from an individual herd or a group of herds or all the herds within a circumscribed area, this campaign inaugurated on a cooperative basis in 1917 will not be abandoned until the disease is entirely controlled. By control we mean that it shall not only cease to be a menace to the livestock industry of this nation but in addition that it shall be suppressed entirely by one means or another within the areas in which it exists to such an extensive degree.

For more than ten years the crystallization of public opinion against the shipment of tuberculous cattle interstate, for purposes other than immediate slaughter, has been making its impression on the live-stock owners where the disease exists. True, the impression came slowly and was accomplished at times only through economic coercion, but happily the impression was so indelibly implanted that there are but few, if any, who now attempt to ship tuberculous cattle under the guise of healthy animals. The dairymen of Nevada or Arizona or Florida who contemplate purchasing improved cattle look up the record of the State, the county and the herd from which they consider the acquisition of the animals. They want to know not only that the individual cows they buy have been tuberculin tested, but that the entire herd out of which they purchase is under supervision and that its health has been demonstrated so far as it is possible to reveal the true conditions.

PROGRESS IN TUBERCULOSIS ERADICATION

It is expected that eradication of tuberculosis will go on with ever-increasing rapidity until the disease becomes circumscribed within the badly infected areas. Then eradication in those areas must be conducted vigorously, otherwise the disease will mean tremendous financial loss to the livestock owners. There is no endeavor to picture an optimistic perspective of the future and acclaim the harmonious progress of tuberculosis work to its ultimate consummation. The views expressed are only those consistent with the history of the suppression of infectious diseases of livestock within this country. Tuberculosis challenged the indomitable will of the livestock owners of America, and they in their characteristic militant way accepted the challenge and are making headway against the enemy and will win as they were victorious in their campaigns against pleuropneumonia, foot-and-mouth disease and the various other diseases attacked by them.

Substantial progress has been made in several of the States in the suppression of tuberculosis. The elimination of the disease from all of the herds within entire counties or other units of territory is being conducted in approximately 150 counties, and the tendency seems to be at the present time for an expansion of this system of carrying on the campaign.

As indicated previously in this report, it is not unreasonable to expect that within a few years tuberculosis will have been practically exterminated in a number of States where the infection is comparatively slight. This will enable the concentration of forces in States where the problem is of greater magnitude, and with the continued support of the livestock industry inroads can be made upon the infected herds and gradually they can be converted by the elimination of the diseased animals and the building up of sound herds.

The task is no less a tremendous one now than it was in 1917, but time has revealed the extent of tuberculosis in the respective States and this stands out now in contrast with the obscurity of the facts as they existed several years ago. This immense campaign now in progress contemplates the suppression of tuberculosis. The whole structure is founded on the established fact that the disease can be eradicated in the individual herd and among groups of herds of cattle. In order that the campaign shall endure until the aims are accomplished, we must pledge our faith to the principle that the methods known and practiced, although not perfect by any means, will accomplish the eradication of animal tuberculosis. Time and practice will evolve better methods and a more perfect system that will aid in the campaign. No evolution or any degree of perfection can be accomplished if we cease our efforts and wait for the millennium

to come. All is not perfection in the cooperative plan of eradicating tuberculosis of livestock. It is just a plan developed by practice during the course of many years and will undergo whatever further changes practice and experience show to be necessary.

A summary of tuberculosis eradication work for five years and the status of this work June 30, 1922, are given in the accompanying tables.

SUMMARY OF TUBERCULOSIS ERADICATION WORK IN COOPERATION WITH THE VARIOUS STATES, FISCAL YEARS 1917–1922

States	Cattle Tested	Reactors Found	Per cent Reacted	Number Counties Doing Area Work June 30, 1922
Alabama	79,140	1,118	1.4	8
Arkansas	6,564	103	1.6	.....
California	4,867	146	3.0	2
Colorado	2,027	76	3.8	.....
Connecticut	38,746	5,884	15.2	.....
Delaware	22,306	2,455	11.0	.....
District of Columbia	6,403	72	1.1	.....
Florida	65,543	1,519	2.3	.....
Georgia	56,782	1,067	1.9	10
Idaho	78,388	1,244	1.6	26
Illinois	114,882	7,420	6.5	5
Indiana	183,010	5,412	3.0	5
Iowa	210,349	12,821	6.1	33
Kansas	79,450	2,101	2.6	2
Kentucky	85,963	2,052	2.4	33
Louisiana	40,960	1,125	2.7	4
Maine	84,324	2,122	2.5	15
Maryland	83,338	6,760	8.0	4
Massachusetts	30,381	2,549	8.4	.....
Michigan	230,083	7,460	3.2	18
Minnesota	275,810	8,206	3.0	.....
Mississippi	107,416	550	0.5	4
Missouri	265,634	3,279	1.2	22
Montana	210,469	3,738	1.8	6
Nebraska	199,950	6,206	3.1	20
Nevada	31,664	1,140	3.6	10
New Hampshire	23,704	2,415	10.2	1
New Jersey	39,443	2,895	7.3	.....
New Mexico	7,338	70	1.0	8
New York	218,646	28,623	13.1	27
North Carolina	103,369	1,455	1.4	45
North Dakota	160,652	4,928	2.9	8
Ohio	115,182	5,219	4.5	.....
Oklahoma	79,991	2,698	3.4	.....
Oregon	149,086	2,997	2.0	36
Pennsylvania	123,715	7,279	5.9	1
Rhode Island	4,151	370	8.9	.....
South Carolina	49,080	806	1.6	31
South Dakota	50,167	2,684	5.4	4
Tennessee	98,167	1,076	1.1	3
Texas	70,259	1,314	1.9	.....
Utah	64,883	637	1.0	12
Vermont	183,254	12,719	6.9	4
Virginia	156,882	4,632	3.0	3
Washington	186,589	4,682	2.5	20
West Virginia	43,654	916	2.1	6
Wisconsin	357,911	10,076	2.8	17
Wyoming	35,781	370	1.0	11
Indian Schools[1]	413	27	6.5	.....
Purebred U. S[1]	4,486	157	6.5	.....
Total	4,931,252	185,670	3.8	494

[1] 1917

STATUS OF TUBERCULOSIS ERADICATION WORK IN COOPERATION WITH VARIOUS STATES, JUNE 30, 1922

States	Once Tested, Free		Accredited		Under Supervision	
	Herds	Cattle	Herds	Cattle	Herds	Cattle
Alabama	735	17,444	79	3,458	837	26,344
Arkansas	39	845	35	1,084	81	2,000
California	129	1,370	0	0	173	4,676
Colorado	7	269	1	37	18	759
Connecticut	475	8,613	83	2,180	813	18,189
Delaware	1,120	4,690	125	1,470	1,825	9,625
District of Columbia	141	345	194	815	340	1,373
Florida	3,133	23,865	88	3,113	4,014	44,761
Georgia	1,812	26,523	21	1,558	2,006	36,242
Idaho	5,056	40,454	116	4,031	5,607	51,371
Illinois	709	12,740	368	8,589	3,449	44,452
Indiana	8,970	62,290	1,308	22,326	11,753	109,557
Iowa	3,500	51,690	779	23,649	5,757	113,797
Kansas	395	10,500	388	11,800	1,000	32,053
Kentucky	5,347	41,273	194	5,500	6,781	57,251
Louisiana	516	11,542	63	2,681	591	17,023
Maine	6,748	56,203	523	6,413	8,555	71,726
Maryland	1,632	16,698	386	7,572	3,455	34,043
Massachusetts	68	1,930	61	2,350	216	7,084
Michigan	13,496	113,519	385	7,642	16,727	149,711
Minnesota	2,022	38,759	1,506	34,833	4,222	91,872
Mississippi	352	11,026	140	3,241	674	15,933
Missouri	18,703	177,465	389	12,400	19,734	205,792
Montana	9,914	126,466	116	6,358	10,845	159,851
Nebraska	7,728	95,390	210	5,877	9,769	134,692
Nevada	1,517	8,873	7	[illegible]882	1,884	18,612
New Hampshire	485	5,111	65	1,717	779	12,145
New Jersey	112	1,693	73	2,007	293	8,304
New Mexico	724	5,575	.....	.....	883	6,827
New York	4,511	53,615	565	12,380	6,543	196,560
North Carolina	20,988	81,545	277	5,604	21,652	87,463
North Dakota	3,593	63,037	721	15,962	5,357	105,058
Ohio	1,523	17,774	848	15,416	2,802	46,118
Oklahoma	391	9,327	182	6,334	1,151	23,421
Oregon	9,163	90,987	170	4,144	9,333	95,131
Pennsylvania	1,039	14,598	1,165	19,501	3,005	49,454
Rhode Island	17	544	14	304	42	1,213
South Carolina	882	10,875	80	2,639	1,765	17,209
South Dakota	293	7,600	218	4,733	610	15,452
Tennessee	669	13,020	198	7,623	6,164	94,072
Texas	46	1,714	66	2,211	231	16,386
Utah	6,238	21,994	77	2,457	6,855	42,763
Vermont	2,460	35,573	1,165	17,675	4,440	65,415
Virginia	1,300	14,407	675	15,792	2,410	42,599
Washington	5,687	43,869	111	2,871	6,166	52,829
West Virginia	2,029	17,337	224	4,828	2,426	26,475
Wisconsin	2,345	49,505	1,754	39,735	5,066	120,477
Wyoming	2,774	27,701	3	110	3,083	32,235
Total	161,533	1,548,183	16,216	363,902	212,182	2,616,395

TUBERCULOSIS ERADICATION HELPS RATHER THAN HINDERS MILK PRODUCTION

From July 1, 1917, to June 30, 1922, there were destroyed 175,000 tuberculous cattle. It was believed by some when the campaign began that the destruction of so many cattle would cause a shortage of dairy products and that the publicity given to the campaign would cause such alarm among the consumers of dairy products that it would work a great injury to the dairy industry. But instead of producing those results the increasing efforts to improve the health of herds have inspired more faith in the safety and value of foods from the dairy cows. Within the last four years several hundred towns have issued regulations requiring the tuberculin testing of dairy cows. On June 10, 1922, it was reported by the United States Department of Agriculture that the production of milk during 1921 was estimated at 98,862,276,000 pounds, a gain over 1920. The aver-

age per capita consumption of milk during that year was 49 gallons, the largest consumption on record. The number of milk cows increased during that year compared with 1920. Also the production of butter increased during the same period. Milk cows on farms increased 341,000 head during 1921.

THE CONTROL OF BOVINE TUBERCULOSIS FROM A PUBLIC HEALTH STANDPOINT

The Committee on Tuberculosis in the past has not undertaken to report data concerning the transmissibility of bovine tuberculosis to the human family, for the reason that it is generally accepted that this is a question that should be left to the medical profession and that our profession should confine itself to the study and control of diseases of livestock and the dissemination of knowledge pertaining to the health of livestock as an economic problem.

The serious study and investigation of bovine tuberculosis as a public health question was stimulated by the activity of those who questioned the statements of the late Dr. Robert Koch that the danger to man from bovine tuberculosis was negligible. Observations made since that time have established more firmly than ever that the transmission of the bovine type of tuberculosis to man is not uncommon and that at least 10 per cent (Park) of the deaths from tuberculosis in children under five years of age are the result of infection of bovine origin.

The guarding of public health against such sources of infection becomes a public duty and justifies this Association and the veterinary profession in using every honorable means in order that there may be a more general recognition of this question from a public health standpoint.

It is not uncommon to hear that representatives of local health departments and locally prominent members of the medical profession have made statements that the danger of transmission of bovine tuberculosis to the human family is negligible. There still continues to be more or less indifference to this problem on the part of some of the public health officials. As the source of bovine infection to the human family is largely confined to the milk, milk products and meats, a supervision of the production, handling and distribution of these products constitutes an important public health service, and no organized effort or campaign for the control and suppression of human tuberculosis is logical that does not include measures to control bovine tuberculosis. Large sums of money are expended annually for sanitoria to care for individuals with tuberculosis, and larger sums will have to be appropriated for many years to come unless measures are adopted to prevent the infection of new individuals. Certain scientists, health service organizations and commercial dealers in milk and milk products attempt to solve the problem by pasteurization. If pasteurization under rigid regulatory inspection forces could be universally applied, no doubt it would be effective. But it is impossible to obtain that kind of pasteurization except in a few of the larger cities where the inspection service is rigid and complete. Unless milk and cream are properly pasteurized it simply sets up a false standard of security to the public. The larger percentage of our population living on the farms and in the smaller communities must continue to use raw milk and milk products. Proper pasteurization will never become general, nor will it solve the control and elimination of the bovine source of infection to the human family.

The members of this Association should interest themselves in educational campaigns on the relation of animal tuberculosis to the public health. It is not our duty to do educational work pertaining to public health, but we should be in a position to furnish health

authorities with such information as will assist and stimulate them to reach the public through educational institutions, the public press, medical colleges, bulletins and other channels. For these reasons and with the above object in view your committee submits a résumé of certain literature on the transmissibility of bovine tuberculosis to the human family.

Résumé of Literature on the Transmissibility of Bovine Tuberculosis to the Human Family

Park and Krumweide (1)[1] examined 487 cases of tuberculosis to determine the type of bacillus present and recorded 1,033 cases found in the literature, making a total of 1,520 cases. Nine hundred and fifty-five were adults over 16 years of age, 177 were children from 5 to 16 years of age, and 368 were children under 5 years. The bovine type of the bacillus was found present in 35 per cent of the children from 5 to 16 years of age, and in 26 per cent under 5 years. Both the human and bovine types were found in eleven additional cases examined. Examinations made at a foundling asylum on 9 cases in children under 6 years of age, who were fed on cow's milk, showed 5, or over 50 per cent, to be infected with the bovine type. The bovine type was found to be present in 12½ per cent of the fatal cases of tuberculosis in children under 5 years of age in New York City.

Dr. W. H. Park (2) in a later article, as a result of studies of 1,042 cases, drew the following conclusions:

"As the result of a large series of cases reported by ourselves and others, it has been shown:

"1. That children are especially infected and usually the point of entry is the alimentary tract.

"2. That cervical adenitis and abdominal tuberculosis are the most frequent types of infection.

"3. That generalized tuberculosis due to bovine tuberculosis is less frequent.

"4. That bone and joint tuberculosis is most commonly of the human type.

"5. That the meninges are less commonly affected by the bovine than by the human type.

"6. That the infection of adults by bovine bacilli is very infrequent.

"7. That pulmonary tuberculosis due to bacilli of the bovine type is rare."

Park sums up his data in the following two tables:

TABLE 1.—PERCENTAGE OF BOVINE INFECTION[1]

Diagnosis	Adults 16 years and over	Children 5 to 16 years	Children under 5 years
	per cent	*per cent*	*per cent*
Pulmonary tuberculosis	0[2]	0	0
Tuberculosis adenitis, cervical	4	37	57
Abdominal tuberculosis	16	50	68
Generalized tuberculosis	3	40	26
Tubercular meningitis (with or without generalized lesions)	0	0	15
Tuberculosis of bones and joints	5	3	0
Total number of cases studied	686	132	220

[1] Exclusive of the cases of double infections. In considering the pulmonary cases it must be remembered, however, that bovine tubercle bacilli have been isolated from the lung in cases of generalized tuberculosis in children.

[2] If one doubtful case admitted, 0.2 per cent.

Grand total studies 1,042
Total infected with mixed or double infection 4

[1] Figures in parentheses following authors' names refer to list of literature at end of report.

Table 2 shows the importance of bovine infection in those forms of tuberculosis in children which are of great severity.

TABLE 2.—PERCENTAGE OF BOVINE INFECTION (REVISED)

Diagnosis	Children 5 to 16 Years		Children Under 5 Years	
	Combined Figures	Own Figures	Combined Figures	Own Figures
	per cent	*per cent*	*per cent*	*per cent*
Abdominal tuberculosis	66	50	69	75
Generalized tuberculosis, alimentary origin	60	.....	48	66
Generalized tuberculosis	20	.....	11	18
Tubercular meningitis, secondary to tuberculosis of alimentary type	.....	.....	72	.....
Tubercular meningitis (other than preceding)	.....	.....	6	5½

Park concludes as follows: "A careful study of all the factors leads us to estimate that about 10 per cent of all deaths caused by tuberculosis in children under five years of age is due to bovine infection when the milk is not pasteurized."

Dr. A. Philip Mitchell (3) of Edinburgh reports the examination of 72 cases of cervical gland tuberculosis in the Children's Hospital in Edinburgh and found tubercle bacilli of the bovine type in 65 cases, or 90 per cent. (Cattle in the vicinity of Edinburgh are very highly infected with tuberculosis.)

The British Royal Commission (4) announced in 1911 the following: "There can be no doubt that a considerable portion of tuberculosis affecting children is of the bovine type, most particularly that which affects primarily the abdominal organs and the cervical glands." Of 108 cases of tuberculosis examined by this commission, the bovine type was present in 24, or 22 per cent, of the cases.

The British Royal Commission, Second Interim Report (5), states the following conclusion:

"We may briefly sum up the bearings of the result at which we have already arrived, as follows:

"There can be no doubt but that in a certain number of cases the tuberculosis occurring in the human subject, especially in children, is the direct result of the introduction of the bacillus of bovine tuberculosis into the human body; and there also can be no doubt that in a majority at least of these cases the bacillus is introduced through cows' milk. Milk containing bovine tubercle bacilli is clearly a cause of tuberculosis and of fatal tuberculosis in man.

"Of the 60 cases of human tuberculosis investigated by us, 14 of the viruses belonged to Group 1—that is to say, contained the bovine bacillus. If, instead of taking all these 60 cases, we confine ourselves to cases of tuberculosis in which the bacilli were apparently introduced into the body by way of the alimentary canal, the proportion of Group 1 becomes very much larger. Of the total 60 cases investigated by us, 28 possessed clinical histories indicating that in them the bacillus was introduced through the alimentary canal. Of these, 13 belong to Group 1. Of the 9 cases in which the cervical glands were studied by us, 3; and of the 19 cases in which the lesions of abdominal tuberculosis were studied by us, 10 belong to Group 1.

"These facts indicate that a very large proportion of tuberculosis contracted by ingestion is due to tubercle bacilli of bovine source.

"A very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cows' milk containing tubercle bacilli. The presence of tubercle bacilli in

cows' milk can be detected, though with some difficulty, if the proper means be adopted, and such milk ought never be used as food. There is far less difficulty in recognizing clinically that a cow is distinctly suffering from tuberculosis, in which case she may be yielding tuberculous milk. The milk coming from such a cow ought not to form part of human food, and indeed ought not to be used as food at all.

"Our results clearly point to the necessity of measures more stringent than those at present enforced, being taken to prevent the sale or the consumption of such milk."

British Royal Commission (6). Excerpt from Third Interim Report:

"Tuberculosis involving the udder is comparatively common in cows, and in such cases their milk always contains tubercle bacilli and is, therefore, dangerous for human beings consuming it. It was, however, undecided what is the danger, if any, attaching to the milk of tuberculous cows in which the udder presents no evidence of the disease. We, therefore, took the opportunity of making a number of observations and experiments bearing on this point. The experiments were made with the milk of cows which had contracted the disease in the natural way. In natural tuberculosis in the cow, cases which show such obvious symptoms of the disease as emaciation and cough, should be considered separately from the cases in which there are no such signs and in which the disease is to be recognized during life only by means of the injection of tuberculin.

"None of the cows investigated showed any sign of disease of the udder during life, and in all, after slaughtering, the udder was carefully examined for tuberculous lesions and tubercle bacilli. No tuberculosis was found except in one cow in which one quarter of the udder showed four small nodules. These could not possibly have been detected during life.

"We found that the milk of the cows obviously suffering from tuberculosis * * *. contained tubercle bacilli whether the milk was obtained in the ordinary way or was withdrawn from the teat by means of a sterilized catheter. The presence of tubercle bacilli in the milk of cows clinically recognizable as tuberculous confirms the opinion we expressed in our Second Interim Report that the milk of such cows must be considered dangerous for human beings.

"The experiments which we have carried out with regard to the infectivity of the feces of tuberculous cows were dictated by knowledge of the fact that dirt of various kinds from cows and the cowsheds is almost constantly present in milk as it reaches the consumer. Cows suffering from extensive tuberculosis of the lungs must discharge considerable numbers of bacilli from the air passages in the act of coughing and some of the bacilli thus expelled may find their way into the milk. But our experiments indicate that the excrement of cows obviously suffering from tuberculosis of the lungs or alimentary canal must be regarded as much more dangerous than the matter discharged from the mouth or nostrils. We have found that even in the case of cows with slight tuberculous lesions, tubercle bacilli in small numbers are discharged in the feces, while as regards cows clinically tuberculous, our experiments show that the feces contain large numbers of living and virulent tubercle bacilli."

Eastwood and Griffith (7) of Great Britain report tubercle bacilli of the bovine type in 55, or 21.1 per cent, of 261 cases of bone and joint disease examined by them. The percentage of bovine cases were as follows: All ages, 21.1 per cent; under 10 years, 29 per cent; over 10 years, 9.4 per cent. The material in all these cases was removed from an infected bone or joint or from an abscess in the neighborhood of such a lesion. The cases were taken without restriction to age, locality or other circumstance.

Dr. Frazier (8) of Edinburgh examined 70 cases of bone and joint

tuberculosis, of which 50, or 60 per cent, showed the bovine type of the tubercle bacillus. He reports that in the greater number of cases the history indicated that the infection was due to cow's milk.

Dr. Richard M. Smith (9), Massachusetts Antituberculosis League, Boston, Mass.: "In general, tuberculosis of bovine origin represents about 25 per cent of all cases of tuberculosis in children under 5 years of age. In certain types of the disease it is very much more. It is estimated that in New York City between 6 and 10 per cent of the children that die in the hospitals each year of tuberculosis die of bovine tuberculosis. The percentage of cases of bone tuberculosis which are due to bovine infection varies very markedly according to the age of the patient. Taking a series of cases, in 67 cases that were investigated, 70 per cent were of bovine origin, and at least 78 per cent under 4 years, so that beginning with all the cases at 1 year, going up to the children at 12 years of age, it ranges from 100 to 60 per cent. Taking 72 consecutive cases of gland tuberculosis which were operated on, 90 per cent were due to the bovine organism. Of these 72 cases, 38 were under 5 years of age, and all but 3 of the 38 were of bovine origin.

"The real hope of eliminating bovine tuberculosis rests in prevention, not in treatment, and it ought to be possible to entirely eliminate bovine tuberculosis. It comes almost exclusively from milk and its products, from milk and cream and butter, ice cream and cheese. The percentage of bovine active, virulent tubercle bacilli in market butter is quite large."

Dr. Sheridan Delépine (10) of England says:

"Taking all evidence into consideration, it is possible to say without fear of exaggeration that not less than 25 per cent of the children under five years of age which are suffering from tuberculosis were infected primarily by the bovine type of the tubercle bacillus. This rate is much lower than one based on probabilities would be."

Ching Yik Wang (11), Edinburgh, Scotland:

"The material for this study was obtained from the Royal Hospital for Sick Children and the Royal Infirmary, Edinburgh, and consisted of postmortem material from 20 children, ranging from 1 to 15 years of age. When the investigations of previous workers are included, the bacteriological examinations of 281 cases of various clinical forms of tuberculosis in Edinburgh resulted in the isolation of the bovine tubercle bacilli in 78.4 per cent of cases under the age of 5 years, in 70.3 per cent between 5 and 16, and in 7.8 per cent over the age of 16 years. Abdominal tuberculosis and tubercular meningitis are together responsible for about 90 per cent of the summed mortality from tuberculosis in children under 1 year, and about 75 per cent in children between 1 and 5 years. The material from 9 children dead from these two diseases was examined bacteriologically and from 6 the bovine type of tubercle bacillus was isolated.

"From the prophylactic point of view, any measure resorted to in combating the disease should be directed not only against the human spread of infection, but also, and more particularly in the case of children, against the bovine source of infection.

"It should be stated that the material used in the investigations was from children of the poorer classes. The results, therefore, should not be held strictly applicable to the community in general or as representing the conditions prevailing in other localities where the environment may be widely different."

Ching Yik Wang (12) gives the following combined table of all cases:

Special Milk Board, Massachusetts State Board of Health (13): "It is agreed upon by all leading authorities that at least from 5 to 7 per cent of all tuberculosis in human beings is definitely and

	Adults 16 Years and Over		Children 5 to 16 Years		Children Under 5 Years	
	Human	Bovine	Human	Bovine	Human	Bovine
Pulmonary tuberculosis including sputum.	1,000[1]	5	28	.....	45	1
Abdominal tuberculosis	24	7[2]	13	17	29	34
Generalized tuberculosis	39	2	32	3	169	22[3]
Tuberculous meningitis	6	.....	13	5	55	10[3]
Tuberculous genito-urinary	35	4	4	.....	.....	.....
Tuberculous skin	12	3	4	6	2	.....
Tuberculous cervical adenitis	62[4]	10	61[4]	18	75	75
Tuberculous axillary	6	.....	8	.....	4	.....
Tuberculous bones and joints	82[5]	4	255[6]	61	89[7]	54[8]
Latent tuberculous	2	1	2	2	4	1
Miscellaneous (other forms)	5	2	.....	1	.....	2
Total	1,273	38	420	171	415	199
Percentage of bovine infection at each age period		2.9		28.9		32.4

Total	2,516
Mixed strains reported by Park and Krumwiede	11
Grand Total	2,527

[1] Including four atypical strains.
[2] Including one intermediate strain.
[3] Including one mixed strain.
[4] Including one atypical strain.
[5] Including three atypical strains.
[6] Including ten atypical strains.
[7] Including two atypical strains.
[8] Including three mixed strains.

directly of bovine origin, and the possibility of the true percentage being still higher can not be denied."

N. Norvick (14): "It was thought worth while to ascertain, having material at hand, whether the percentage of incidence of bovine infection in tuberculous meningitis is appreciable, greater perhaps than is commonly accepted; whether the bovine type of virus has a special predilection for the meninges.

"Park and Krumweide, in their study of bovine and human infection of tuberculosis in man, a study which included about one thousand cases of all forms of tuberculosis, found 15 per cent of bovine infection in tuberculous meningitis. Rosenau, analyzing 1,040 cases, including those studied by Park and Krumweide, by the English and German Commissions, and some cases collected from literature, came to the following figures:

16 years and over, 686 cases, 9 bovine, 1.3 per cent.
Between 5 and 16 years, 132 cases, 33 bovine, 25 per cent.
Under 5 years, 120 cases, 59 bovine, 49 per cent.

"Rosenau states that 'almost half the number of cases tabulated above were studied by the research laboratory and were unselected.' This is important to note. The striking feature of these figures is the alarming percentage of bovine infection in children under 5 years (49 per cent). In adults the percentage is very small—almost insignificant. Undoubtedly, it is due to milk entering as the chief element in the diet of children and serving as the probable path of transmission of tubercular disease, and the fact that the bovine bacilli are much more virulent in the young."

Edward R. Baldwin and Leroy U. Gardner (15), in an article entitled "Reinfection in Tuberculosis, Experimental Arrested Tuberculosis and Subsequent Infections," state: "To sum up our study of this problem, we believe that the lesson to be learned and applied is that, hand in hand with efforts to safeguard the young from infection, more attention should be paid to safeguarding both young and old from disease. Without sputum and dairy hygiene, the supply of dangerously infected young people will be kept up; without earlier diagnosis, education and favorable conditions of life for the pros-

pective victims, clinical tuberculosis will continue at an irreducible minimum."

Allen K. Krause (16) in an article "The Prevention of Tuberculosis, Based on the Relation of Childhood Infection to Tuberculosis in Adult Life," states: "Yet, that childhood infections are prolific breeders of adult tuberculosis can not be denied. Anyone who comes in contact with many adult consumptives needs no better evidence of this fact than good and thorough histories, which he has pieced together after adroit cross-examination of his patients. Scores of these will satisfy every requirement laid down by the most uncompromising proponent of the puerile genesis of adult disease, and physical examination as it brings to light anatomic evidence of hidden, always silent and never suspected residua, will not infrequently clinch post history."

A. Stanley Griffith (17) reports 1,068 cases of tuberculosis of all ages in the human family, in which 20.7 per cent was of bovine origin; 37.55 per cent in children under 5 years of age, 29.45 per cent in children from 5 to 10 years, 14.66 per cent in children from 10 to 16 years, and 6.25 per cent of cases 16 years and upwards were of bovine origin.

Dr. W. A. Evans (18), Chicago, in a paper entitled "Why Health Departments are Interested in the Eradication of Bovine Tuberculosis," which was read before the tuberculosis eradication conference, Chicago, Ill., November, 1921, states:

"There were 1,096,436 deaths from all causes in the registration area in 1919. Of these, the total number of deaths from all tuberculosis was 106,985, and the total number of deaths of children under 5 from all tuberculosis was 5,830. The estimate of Park is that in 1919, 583 children under five years of age died of tuberculosis due to bovine tubercle bacilli in the registration area. This is an estimate only of deaths due to tuberculosis in children under 5.

"The theory of Von Behring as to the cause of tuberculosis in adults is now decidedly in the ascendant. It is that much, if not most, of the clinical tuberculosis of adult life is the result of infection which has lain dormant for more than a decade, is developed into a clinical disease by some period of stress.

"This theory magnified the importance of infections in childhood, and incidentally of infections with bovine bacilli.

"There have been no adequate studies to determine the possibility that a bovine bacillus infection in childhood may result in the excretion of bacilli conforming to the human type of adult life. In fact, the typing of bacilli excreted by adults having tuberculosis has been wholly inadequate."

Schroeder (19) says: "The bovine bacillus is responsible for tuberculosis in children. Every case of tuberculosis in the human subject due to bovine bacilli must be charged to intimate contact in most cases through the ingestion of contaminated dairy products between persons and tuberculous cattle."

Fishberg (20) says:

"While it is difficult to say how much tuberculosis is of bovine origin and how much of human origin, yet pathologists who have studied the question carefully now agree that about eleven-twelfths of all tuberculosis in man is caused by human bacilli and about one-twelfth by bovine bacilli; and that bovine infection, as it occurs, predominates in childhood, while the human infection, although accountable for a large percentage of disease during childhood, is accountable for nearly all disease of adult life. In this connection the following table from the Imperial German Board of Health is interesting. It presents an analysis of 1,400 investigated cases.

"The studies of Eastwood and Griffith are very interesting in that they have made a special study of the type of infection in bone and

	Total Number Investigated Cases	Type		Percentage of All Cases Due to Bovine Type	
		Human	Bovine	In Adults	In Children
Tuberculosis of the lungs	811	807	5	0.66	0.00
Tuberculosis of the bones and joints	99	95	5	0.66	4.30
Meningeal tuberculosis	33	30	3	0.00	10.34
Generalized tuberculosis	178	147	33	2.50	23.18
Tuberculosis of the cervical glands	167	120	47	5.80	40.70
Tuberculosis of the mesenteric glands	112	78	35	12.10	51.0
Totals	1,400	1,277	128		

joint tuberculosis. Basing their classification upon cultural characteristics and the virulence of the bacilli as shown upon rabbits, they examined a total of 261 cases and found the human type of bacilli in 196, bovine in 55, and a bacillus which they were unable to classify in 10.

"I desire to emphasize in this connection the fact that the bovine type of bacillus disappears very rapidly from clinical tuberculosis after the tenth year, indicating that the bovine bacillus produces infection only during early child life; or that it probably changes its characteristics with growth upon human soil for many years, and assumes the characteristics of the human bacillus.

"We must recognize the fact that our methods of determining the difference between bovine and human infection are not absolutely reliable; yet we can not help noting that the results obtained by different observers agree fairly well. It is also suggestive that all find little bovine infection in adult life.

"These same writers have made a study of the types of bacilli occurring in the genito-urinary tract, and I will quote their summary: 'Seventeen cases were examined, the disease affecting the genital organs in nine instances (7 testicles, 1 salpinx, 1 prostate) and the urinary tract in 8. The bacilli obtained were of "human" type in 14 cases and "bovine" type in 3. The 3 "bovine" cases were affections of the kidney in persons aged, respectively, 25, 19 and 20 years.'

"Griffith further reports an analysis of results obtained from the investigation of sputum of 212 patients, suffering from pulmonary tuberculosis in England and Scotland, with the following results: Isolated the standard human type of bacilli in 205; the standard bovine type in 3; and an atypical human type in 4 of the cases. In discussing this question, Griffith says: 'In this country, therefore, pulmonary tuberculosis which has arrived at the ulcerative stage is but very rarely referable to tubercle bacilli of bovine type.' While such apportionment of bovine and human infection in man seems to be fairly well accepted, yet it comes in conflict with other pathological ideas which seem to be fairly established. We are taught today that clinical tuberculosis in adult life is largely an extension from an infection which takes place in early child life (Romer). If this is true, and our knowledge of the disease supports the theory, what is there to hinder this metastatic infection in later life from being of either bovine or human origin; and, according to the data quoted above, why is not adult tuberculosis more largely of bovine type, unless mutation of type takes place? Children unquestionably take in both types of bacilli and are infected by same; and as yet we do not know that the resulting infections differ to any great extent, or even at all, in their subsequent pathological change or clinical course."

Dr. Louis Cobbett (21), Lecturer in Pathology at Cambridge University, says:

"These remarks introduce the question whether the bovine type of tubercle bacillus is more or less virulent for man than the human type. At first sight it might seem, from the fact that the bovine bacillus is only found in a small proportion of fatal cases of human tuberculosis—cases confined, moreover, to very young children whose susceptibility might be supposed to be greatest—that the bovine type of tubercle is for man, of considerably lower virulence than the human. But is this really the case? A. S. Griffith thinks that it is not. It might be suggested that if comparative inoculations were made, the bovine type would prove a little more virulent for the human being, as for the monkey or the guinea-pig. It has been pointed out that it is easier to infect by the aerial route than by the alimentary route; that the human type of tubercle bacillus has a practical monopoly of this easier route, while the bovine type has no chance of infecting except by the more difficult route of the alimentary canal; consequently the bovine type succeeds, as a rule, only in young children, when susceptibility is high and milk, the chief carrier of bovine bacilli, is taken in large quantities. I think this line of argument is worthy of serious consideration.

"The fact that bovine tubercle bacilli are so frequent in mesenteric glands and are so rare in the lungs is in opposition to Calmette's view that pulmonary tuberculosis is commonly caused by tubercle bacilli absorbed through the intestinal mucous membrane, and carried by the thoracic duct and the innominate vein to the right side of the heart, and so to the lungs. If this were the common channel of infection, we should expect to find the same proportion of bovine infections in pulmonary as in abdominal tuberculosis. Lastly, the fact that bovine tubercle bacilli have frequently been found in abdominal and cervical tuberculosis (that is, in cases arising from infection through some part of the alimentary canal) and seldom in the lungs, is easily explained on the ground that human tubercle bacilli alone are sprayed into the air, therefore alone have a chance of entering the lungs directly, while bovine tubercle bacilli, being limited to food substances, can only infect man through the alimentary canal. The inhalation theory of the origin pulmonary tuberculosis thus receives strong support.

"In cases of lupus it is, at first sight, surprising to find so high a proportion of bovine infections as 50 per cent. Lupus usually arises on the face and, to a lesser extent, on the buttocks, to which the tubercle bacilli may be considered to have access after passing through the alimentary canal. It may therefore be considered that usually, when it is not secondary to ulceration of a caseous gland, it is caused by direct application of tubercle bacilli to the skin. Now, bovine bacilli in milk and tubercle bacilli of human type which, whether dry or moist, get into the air from consumptive patients, have, probably, about an equal chance of getting to the skin of the face in numbers sufficient to cause infection. Hence it is that the proportion of infections with one type of mammalian tubercle bacillus is about equal to that of the other.

"The percentage of total mortality from all kinds of tuberculosis caused by the bovine tubercle bacillus in England and Wales, in the year 1919, was 6.5, and therefore due to infection coming from the cow, probably in the immense majority of cases through milk."

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PRESIDENT KINSLEY: You have been privileged to hear a very splendid report. What is your pleasure?

(On motion of Dr. Faust the report was received.)

COMMITTEE ON REVISION OF NATIONAL FORMULARY

PRESIDENT KINSLEY: We have one other committee report that we can dispose of this afternoon, that of the Committee on Revision of National Formulary. Dr. Brumley was chairman, Dr. Klein brought the report in, and Dr. Mayo has it and will read it.

(Secretary Mayo read the report, which follows.)

In the revision of the National Formulary by the General Committee it was thought advisable to request the various national organizations to appoint special committees to assist with the portions of the revision of special interest to them. Accordingly this request was presented to the American Veterinary Medical Association, and

President Kinsley created the present committee to go over the formulas at present in the National Formulary and also to present any new formulas that might seem desirable from a professional standpoint and report direct to the General Committee.

In order to obtain the desires of the members of the A. V. M. A. in regard to methods of procedure and what formulas should be included in the revision of the National Formulary, it was decided by the committee to send out a questionnaire for such information. The following abstract of letters and questions was sent to 750 members of the A. V. M. A.:

"The committee desires to have the advice and assistance of the members of the Association in carrying out its work, and therefore we are writing to you and other members of the Association for suggestions.

"Are there any formulas which are frequently used by yourself or other veterinarians the publication of which in the National Formulary would be a convenience to the veterinary profession in general? If so, will you not send them to the chairman of the committee?

"Can any of the formulas at present published in the National Formulary be changed in any way to make them more useful to veterinarians? The committee will be glad to have your opinion on this question.

"The revision of the National Formulary is now under way, preparatory to issuing a new edition. and all changes and additions to be made must be decided upon very soon. Will you not therefore give the above questions prompt and careful consideration and send us any new formulas or changes you may have to suggest as soon as possible?"

The selection of names for the purpose of sending out the letter and questionnaire was made by writing to the Resident State Secretaries with the request that they send by return mail the names and addresses of twenty of the prominent veterinarians in their State who would probably be interested in this work. Some difficulty was encountered in obtaining replies from the State Secretaries. In a few instances it was necessary to make selections ourselves from the roll of members of the A. V. M. A.

As stated before, 750 letters and questionnaires were sent to the list thus obtained. The result was unsatisfactory. Only a few replies were obtained. Many veterinarians are evidently unacquainted with the National Formulary and did not seem interested in such a book. Some few suggestions were received and were gone over carefully by the members of the committee, but in the majority of instances the committee did not feel justified in recommending them for incorporation in the National Formulary. Therefore, only a few new formulas have been recommended which are in common use and have been found to be efficient and which, it seemed, should be incorporated in the National Formulary to make them more convenient and accessible to the profession in general.

A list of the formulas at present in the National Formulary were considered and a recommendation made that they be continued in the present revision.

The complete report sent to the National Committee follows:

"The committee appointed by the President of the American Veterinary Medical Association to suggest formulas which might be useful to veterinarians for incorporation in the National Formulary and also to recommend any changes which may seem desirable in the formulas included in that publication begs leave to submit the following:

"In order to obtain information from the veterinary profession their desires in this matter, and also to aid the committee in its

action, it was decided to send a questionnaire to representative members of the A. V. M. A. in each of the States. These questions consist of two parts:

"1. New formulas which were frequently used by them or other veterinarians the publication of which would be a convenience to the veterinary profession in general.

"2. Suggestions for changes in the formulas at present in the National Formulary which would make them more desirable and useful to veterinarians.

"1. Under this section of our questionnaire we were unable to obtain very much information. Some formulas were suggested, but the majority of them were of minor importance and the committee does not feel justified in recommending them as having sufficient merit to be incorporated in the National Formulary.

"The following formulas are recommended under this section by the committee, the members of which are unanimous in their opinion that they should be incorporated in the National Formulary:

(*a*) *White Lotion.*
Zinc sulphate.....6 drams
Lead acetate.....1 ounce
Water.....30-40

(*b*) *Iodin Ointment.*
(Colorless.)

(*c*) *Iodized Calcium.*

(*d*) *Camphorated Oil* (20%)
For hypodermic use.

(*e*) *Elixir Terpin Hydrate.*

"The committee has made no effort to standardize these formulas, as it is understood that your special committee will properly prepare them for incorporation in the National Formulary.

"2. You will find appended to list of formulas already in the National Formulary that our committee recommends for retention in the present revision.

"H. J. MILKS,
"L. A. KLEIN,
"O. V. BRUMLEY, *Chairman.*"

Preparations from the National Formulary to be Retained, as Recommended by the Committee of the American Veterinary Medical Association.

CATAPLASMA KAOLINI
Cataplasm of Kaolin
(U. S. P. VIII)
Catapl. Kaolin.

Kaolin, recently dried at 110° C. and cool, and in very fine powder, five hundred and sixty-five grammes	565.0 Gm.
Boric Acid, in very fine powder, forty-five grammes	45.0 Gm.
Thymol, five-tenths of a gramme	0.5 Gm.
Methyl Salicylate, two grammes	2.0 Gm.
Oil of Peppermint, five-tenths of a gramme	0.5 Gm.
Glycerin, recently heated to 100° C., three hundred and eighty-seven grammes	387.0 Gm.
To make about one thousand grammes	1000 Gm.

Mix the kaolin with the boric acid, and then thoroughly incorporate the warm glycerin. Finally add the thymol, dissolved in the methylsalicylate and oil of peppermint, and make into a homogeneous mass. Preserve it in air-tight containers.

ELIXIR TERPINI HYDRATIS ET DIACETYLMORPHINÆ

Elixir of Terpin Hydrate and Diacetylmorphine

Elix. Terpin. Hyd. et Diacetylmorph. Elixir Terpini Hydratis cum Heroina, N. F. III

Diacetylmorphine Hydrochloride, twenty-seven hundredths of a gramme.	0.27 Gm.
Elixir of Terpin Hydrate, a sufficient quantity,	
To make one thousand milliliters.....	1000 mils

Dissolve the diacetylmorphine hydrochloride in sufficient of the elixir to measure one thousand milliliters and filter.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM ARNICÆ

Fluidextract of Arnica

Fldext. Arnic

Arnic, in No. 20 powder, one thousand grammes.....	1000 Gm.

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

Average dose—Metric, 0.1 mil—Apothecaries, 1½ minims.

FLUIDEXTRACTUM BUCHU COMPOSITUM

Compound Fluidextract of Buchu

Fldext. Buchu Co.

Buchu, in No. 40 powder, six hundred and twenty-five grammes.....	625 Gm.
Cubeb, in No. 40 powder, one hundred and twenty-five grammes.....	125 Gm.
Juniper Berries, in No. 20 powder, one hundred and twenty-five grammes.	125 Gm.
Uva Ursi, in No. 40 powder, one hundred and twenty-five grammes....	125 Gm.

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of two volumes of alcohol and one volume of water as the menstruum.

Average dose—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM STRAMONII

Fluidextract of Stramonium

(U. S. P. VIII)

Fldext. Stramon.

One hundred milliliters of Fluidextract of Stramonium yields not less than 0.22 Gm. nor more than 0.28 Gm. of the alkaloids of Stramonium.

Stramonium, in No. 40 powder, one thousand grammes.....	1000 Gm.

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of two volumes of alcohol and one volume of water as the menstruum.

After dissolving the soft extract in the reserve, assay 10 mils of this liquid as directed below, and, from the result thus obtained, ascertain by calculation the amount of alkaloids in the remainder of the liquid and add to this enough menstruum to make the finished Fluidextract contain 0.25 Gm. of the alkaloids of stramonium in each one hundred milliliters.

Assay—Introduce 10 mils of Fluidextract of Stramonium into a separator and add 10 mils of distilled water and 2 mils of ammonia water. Completely extract the alkaloids by shaking out repeatedly with chloroform and then extract the alkaloids from the chloroform solution by shaking out repeatedly with weak sulphuric acid until the alkaloid is completely removed. Collect the acid washings in a separator, add ammonia water until the solution is decidedly alkaline to litmus, and completely extract the alkaloid by shaking out repeatedly with chloroform. Evaporate the combined chloroform washings to dryness, dissolve the alkaloids from the residue in exactly 5 mils of tenth-normal sulphuric acid V. S. and titrate the excess of acid with fifteenth-normal potassium hydroxide V. S., using cochineal T. S. as indicator.

Each mil of tenth-normal sulphuric acid V. S. consumed corresponds to 28.92 milligrammes of the alkaloids of stramonium.

Average dose—Metric, 0.05 mil—Apothecaries, 1 minim.

LINIMENTUM TEREBINTHINÆ ACETICUM

Acetic Turpentine Liniment

Lin. Terebinth. Acet.

Linimentum Album. Stokes Liniment. St. John Long's Liniment

Oil of Turpentine, four hundred milliliters.....	
Oil of Lemon, sixteen milliliters.....	400 mils
Acetic Acid, eighty milliliters.....	16 mils
Hen's Egg	80 mils
Rose Water, each, a sufficient quantity,	
To make one thousand milliliters.....	1000 mils

Triturate the contents of two fresh eggs and the yolks of two others with the oil of turpentine and the oil of lemon in a mortar until they are thoroughly mixed.

Then incorporate the acetic acid and sufficient rose water to make the product measure one thousand milliliters.

Shake the liniment, whenever any of it is to be dispensed.

LINIMENTUM SAPONATO-CAMPHORATUM

Camphorated Soap Liniment

Lin. Sapon.-Camph. Opodeldoc Solid Opodeldoc

Monohydrated Sodium Carbonate, ten grammes	10 Gr.
Stearic Acid, fifty grammes	50 Gr.
Water, one hundred milliliters	100 mils
Camphor, in fine powder, twenty-five grammes	25 Gm.
Oil of Thyme, three milliliters	3 mils
Oil of Rosemary, six milliliters	6 mils
Ammonia Water, fifty milliliters	50 mils
Alcohol, a sufficient quantity,	
To make one thousand milliliters	1000 mils

LIQUOR ANTISEPTICUS

Antiseptic Solution

(Replacing U. S. P. VIII)

Liq. Antisept.

Boric Acid, twenty-five grammes	25.0 Gm.
Thymol, one gramme	1.0 Gm.
Eucalptol, five milliliters	5.0 mils
Methyl Salicylate, one and two-tenths milliliters	1.2 mils
Oil of Thyme, three-tenths of a milliliter	0.3 mil
Menthol, one gramme	1.0 Gm.
Sodium Salicylate, one and two-tenths grammes	1.2 Gm.
Sodium Benzoate, six grammes	6.0 Gm.
Alcohol, three hundred milliliters	300.0 mils
Purified Talc, twenty grammes	20.0 Gm.
Water, a sufficient quantity,	
To make one thousand milliliters	1000 mils

Dissolve the boric acid, sodium benzoate and sodium salicylate in six hundred milliliters of water and the other ingredients in two hundred milliliters of alcohol. Pour the aqueous solution into the alcohol solution, add the talc and allow the mixture to stand, with occasional agitation, during forty-eight hours. Then filter, returning the first portions of the filtrate and then sufficient water to make the product measure one thousand milliliters.

Average Dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR SODII BORATIS COMPOSITUS

Compound Solution of Sodium Borate

Liq. Sod. Bor. Co. Dobell's Solution

Sodium Borate, fifteen grammes	15 Gm.
Sodium Bicarbonate, fifteen grammes	15 Gm.
Liquefied Phenol, three milliliters	3 mils
Glycerin, thirty-five milliliters	35 mils
Water, a sufficient quantity,	
To make one thousand milliliters	1000 mils

Dissolve the sodium borate and sodium bicarbonate in about five hundred milliliters of water, add the glycerin and liquefied phenol, and allow the mixture to stand half an hour or until the effervescence has ceased; then add sufficient water to make the product measure one thousand milliliters and filter.

PILULÆ ALOINI, STRYCHNINÆ ET BELLADONNÆ COMPOSITÆ

Compound Pills of Aloin, Strychnine and Belledonna

Pil. A. A. et B. Co.

Aloin, one and three-tenths grammes	1.30 Gm.
Strychnine, five hundredths of a gramme	0.05 Gm.
Pilular Extract of Belladonna Leaves, eight-tenths of a gramme	0.80 Gm.
Extract of Cascara Sagrada, three and twenty-five hundredths grammes	3.25 Gm.
To make one hundred pills	100 pills

Uniformly mix the several ingredients, form a mass and divide it into one hundred pills.

Average dose—1 pill.

PILULÆ FERRI, QUININÆ, ALOES ET NUCIS VOMICÆ

Pills of Iron, Quinine, Aloes and Nux Vomica

Pil. Ferr. Quin. Aloe. et Nuc. Vom. Pilulæ Quadruplices, N. F. III. Quadruplex Pills. Pilulas Ferri et Quininæ Compositæ

Exsiccated Ferrous Sulphate, six and five-tenths grammes	6.5 Gm.
Quinine Sulphate, six and five-tenths grammes	6.5 Gm.
Aloes, six and five-tenths grammes	6.5 Gm.
Extract of Nux Vomica, one and six-tenths grammes	1.6 Gm.
Extract of Gentian, a sufficient quantity,	
To make one hundred pills	100 pills

Mix the extract of nux vomica with the aloes, thoroughly incorporate the ferrous sulphate and quinine sulphate, then form a mass with the extract of gentian and divide it into one hundred pills.

Average dose—1 pill.

SAL CAROLINUM FACTITIUM

Artificial Carlsbad Salt

Sal. Carol. Fact.

1. In dry, amorphous form:

Potassium Sulphate, two grammes	2 Gm.
Sodium Chloride, eighteen grammes	18 Gm.
Sodium Bicarbonate, thirty-six grammes	36 Gm.
Sodium Sulphate, one hundred grammes	100 Gm.
To make about one hundred grammes	100 Gm.

Mix the sulphate and chloride and dry to constant weight at about 40° C., cool, add the sodium bicarbonate and mix thoroughly.

2. In crystalline form:

Postassium Sulphate, in crystals, two grammes	2 Gm.
Sodium Chloride, in crystals, eighteen grammes	18 Gm.
Monohydrated Sodium Carbonate, twenty-eight grammes	28 Gm.
Sodium Sulphate, in crystals, one hundred grammes	100 Gm.
Distilled Water, one hundred milliliters	100 mils
To make about one hundred and eighty grammes	180 Gm.

Dissolve the potassium sulphate and sodium chloride in the distilled water, and add this solution to the other two salts, previously melted in a tared dish, at a gentle heat, in their own water of crystallization. Evaporate the mixture to one hundred and eighty grammes, set it aside in a cool place, and stir it frequently, to prevent the formation of large crystals, taking care, however, that none of the salt separates in a pulverulent form. Distribute any remaining mother liquor uniformly over the crystals, and dry the whole mixture sufficiently by exposure to air, so that it will retain its crystalline character.

NOTE.—A solution of 1 Gm. of the dry or 1.75 Gm. of the crystalline salt in 200 mils of water is similar to an equal volume of Carlsbad water (Sprudel) in its main constituents.

SYRUPUS RHAMNI CATHARTICÆ

Syrup of Rhamnus Cathartica

Syr. Rham. Cathart. Syrup of Buckthorn Berries. Syrupus Spinæ Cervinæ

Fluidextract of Rhamnus Cathartica, two hundred milliliters	200.0 mils
Oil of Fennel, two-tenths of a milliliter	0.2 mil
Oil of Cinnamon, two-tenths of a milliliter	0.2 mil
Syrup, a sufficient quantity,	
To make one thousand milliliters	1000 mils

Add the oils to the fluidextract and mix this with sufficient syrup to make the product measure one thousand milliliters.

Average dose—Metric, 8 mils—Apothecaries, 2 fluidrachms.

TINCTURA ALOES ET MYRRHÆ

Tincture of Aloes and Myrrh

(U. S. P. VIII)

Tr. Aloe. et Myrrh.

Aloes, in No. 40 powder, one hundred grammes	100 Gm.
Myrrh, in No. 40 powder, one hundred grammes	100 Gm.
Glycyrrhiza, in No. 40 powder, one hundred grammes	100 Gm.
Alcohol,	
Water, each a sufficient quantity,	
To make one thousand milliliters	1000 mils

Mix seven hundred and fifty milliliters of alcohol with two hundred and fifty milliliters of water. Macerate the aloes, myrrh, and glycyrrhiza in a stoppered container, in a moderately warm place, with seven hundred and fifty milliliters of the menstruum, for seven days, with occasional agitation; then filter through purified cotton, or a plain filter, and, when the liquid has drained off completely,

pass enough menstruum through the residue to make the product measure one thousand milliliters.

Average dose—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA SABAL ET SANTALI

Tincture of Saw Palmetto and Santal

Tr. Sabal. et Santal

Sabal, in about No. 16 powder, two hundred grammes	200 Gm.
Sandal Wood, in No. 60 powder, sixty-five grammes	65 Gm.
Alcohol,	
Water, each, a sufficient quantity,	
To make one thousand milliliters	1000 mils

Mix four volumes of alcohol with one volume of water, and saturate the drugs with this menstruum. After macerating for two days, percolate them in the usual manner with sufficient menstruum of the same strength until the product measures one thousand milliliters.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

UNGUENTUM RESORCINOLIS COMPOSITUM

Compound Resorcinol Ointment

Ung. Resorcin. Co.

Resorcinol, six grammes	6 Gm.
Zinc Oxide, six grammes	6 Gm.
Bismuth Subnitrate, six grammes	6 Gm.
Rectified Oil of Birch Tar, six grammes	6 Gm.
Yellow Wax, ten grammes	10 Gm.
Petrolatum, twenty-five grammes	25 Gm.
Anhydrous Wool Fat, twenty-eight grammes	28 Gm.
Glycerin, thirteen grammes	13 Gm.
To make one hundred grammes	100 Gm.

Melt the yellow wax and anhydrous wool fat in a dish on a water bath. Rub the zinc oxide and bismuth subnitrate with the petrolatum until smooth and add it to the melted mixture. Dissolve the resorcinol in the glycerin, incorporate the solution with the warm mixture just prepared, then add the oil and stir the ointment until it is cold.

UNGUENTUM SULPHURIS ALKALINUM

Alkaline Sulphur Ointment

Ung. Sulphur. Alk.

Sublimed Sulphur, twenty grammes	20 Gm.
Potassium Carbonate, ten grammes	10 Gm.
Water, five milliliters	5 mils
Benzoinated Lard, sixty-five grammes	65 Gm.
To make one hundred grammes	100 Gm.

Rub the sulphur with the potassium carbonate and the water, until a smooth, homogenous mixture results, then gradually add the benzoinated lard, and mix thoroughly.

UNGUENTUM ZINCI STEARATIS

Ointment of Zinc Stearate

(U. S. P. VIII)

Ung. Zinc. Stear.

Zinc Stearate, in fine powder, fifty grammes	50 Gm.
White Petrolatum, fifty grammes	50 Gm.
To make one hundred grammes	100 Gm.

Rub the zinc stearate with the white petrolatum until a smooth ointment is produced.

VINUM COLCHICI SEMINIS

Wine of Colchicum Seed

(U. S. P. VIII)

Vin. Colch. Sem.

One hundred mililiters of Wine of Colchicum Seed yields not less than 0.036 Gm. nor more than 0.044 Gm. of colchicine.

Fluidextract of Colchicum Seed, one hundred milliliters	100 mils
Alcohol, one hundred and fifty milliliters	150 mils
Sherry Wine, seven hundred and fifty milliliters	750 mils
To make one thousand milliliters	1000 mils

Mix them. Set the mixture aside for two days and then filter.

Assay—Evaporate 150 mils of Wine of Colchicum Seed to 15 mils and proceed as directed under Fluidextractum Colchici Cormi.

Average Dose—Metric, 2 mils—Apothecaries, 30 Minims.

MISTURA ADSTRINGENS

Astringent Mixture

Mist. Adstring.

Mistura Adstringens et Escharotica, N. F. III. Villate's Mixture

Solution of Lead Subacetate, one hundred milliliters	100 mils
Copper Sulphate, sixty-five grammes	65 Gm.
Zinc Sulphate, sixty-five grammes	65 Gm.
Diluted Acetic Acid, eight hundred and fifty milliliters	850 mils

Dissolve the copper sulphate and zinc sulphate in the diluted acetic acid, add the solution of lead subacetate, and agitate thoroughly.

Shake this preparation well before dispensing it, so that the precipitate will be uniformly distributed.

On motion of Dr. Connaway the report was accepted.

Adjournment.

SMALL-ANIMAL SECTION

WEDNESDAY MORNING, AUGUST 30, 1922

The Small-Animal Section of the A. V. M. A. convened at 10:15 a. m., at the Planters Hotel, St. Louis, Mo., Chairman J. C. Flynn, of Kansas City, Mo., presiding.

CHAIRMAN FLYNN: Not many years ago, you will recall, you who have been attending the meetings, that if a paper was presented on small animals, or a clinical case presented, the practitioners were somewhat disgusted. Many of them would get up and leave the room. If they sat and listened, they listened with indifference. A vast change is coming over veterinary practice. If those who are interested in small-animal work take the trouble to investigate a little or to listen, they will find that all over the country the veterinarians are waking up to the possibilities of small-animal work, and particularly is this true in the cities.

About two or three weeks ago I attended a State meeting in Oklahoma City, and I found there a new hospital for small animals, that had just been finished, and it was crowded. The hospital had been completed only a few days, and it was filled up.

The fact that we haven't had a good-sized small-animal practice is the fault of the veterinarians and not the fault of the public. The public was ready for it for years, but the veterinarian has given his time to the large animals and wasn't interested in that. When the tractors came along and took away a good deal of that practice, they began to look around for other fields to develop. The field was already there and could have been developed many years ago. One doctor told me yesterday that he built his hospital two years ago, and said, "I am only sorry I didn't build my place ten years ago." He said it was a success, and when he was equipped to give service the people wanted it.

In preparing this program, we looked over the field and tried

to secure the very best men we could possibly get. I want to take this opportunity to say that the men have cooperated with me in every respect in preparing this program. In only one case was I refused a paper by anyone whom I requested to prepare one, and he had an ample excuse. The local committee here, Dr. Jennemann, Dr. Darling and Dr. Ellis, have worked untiringly to prepare clinical material, and I am confident that this afternoon we will have ample material to present some most interesting cases; in fact, cases that come up in every-day practice, cases that will be of interest to you. Some dogs were shipped from Texas Saturday, and we haven't heard from them. A dog was shipped from Kansas City, and we haven't heard from him. We had some animals shipped from Colorado last Saturday, and they have arrived. If there is any failure of clinical cases it will be charged up to the railroads and not to the committee in charge, because they have been loyal and faithful and have done everything they could to make this meeting a success.

The first paper on our program is one by Dr. O. V. Brumley, of Columbus, Ohio, entitled, "Gastroenteritis in Small Animals." Dr. Brumley was unable to attend the meeting, but he prepared his paper and sent it in. Dr. E. L. Quitman, of Chicago, will present it.

(Dr. Brumley's paper appeared in the November JOURNAL, page 200. The discussion following it appears elsewhere in this issue.)

WEDNESDAY AFTERNOON, AUGUST 30, 1922

The meeting convened at 2 o'clock, Chairman Flynn presiding.

CHAIRMAN FLYNN: We will ask Dr. Frick, of Manhattan, Kans., to present the paper of Dr. W. E. Muldoon on "Sequelæ of Canine Distemper."

(Dr. Frick read Dr. Muldoon's paper, which, with the discussion following it, appears elsewhere in this issue of the JOURNAL.)

CHAIRMAN FLYNN: The next paper will be "Internal Parasites of Dogs and Cats, and Treatment for Removing These Parasites," by Dr. M. C. Hall. The paper will be read by Dr. Hoskins, of Detroit.

(Dr. Hoskins read Dr. Hall's paper, which will appear later.)

CHAIRMAN FLYNN: It seems from Dr. Hall's paper that intestinal parasites of the cat and dog are giving Heinz pickles a close race. There are 47 varieties of the parasites, and Heinz pickles have 57. According to Dr. Hall we still have hopes. He says possibly we will soon be up to the 50 mark.

We will have as the next number on our program a discussion of the diagnosis of demodectic mange, hookworms and *Filaria immitis*, presented by Dr. R. P. Marsteller, of College Station, Tex.

PARASITES OF DOGS—R. P. MARSTELLER

DR. MARSTELLER: In diseases of dogs that we have to deal with, over 90 per cent of the dogs are infested with some parasite. We have found that in handling dogs, especially by routine in connection with students, it is advisable to make microscopic examination of the feces and blood. This may not apply so well in other sections of the country, but with us it is important. Several phases are of vital importance, particularly in the purchase of dogs. In our part of the country somewhere between 20 to 25 per cent of the dogs have heart worms. Men buying what they call stock dogs, which are used for working cattle, especially in parts of the country where they are dipping cattle, must be very careful. It is the same with valuable hunting dogs and other dogs. If these worms are present the dogs can not stand work. Then we find we have some dogs with heavy infestations of hookworm and other parasites, which makes an examination rather important.

My main idea in presenting this subject to the A. V. M. A. was to call your attention to the simplicity of making a microscopic examination for parasites, and the fact that you can do it with a very simple microscope. You can get one that will do the business from a mail-order house for $12.50.

It has already been mentioned that successful treatment will cure these different parasites, but the treatment varies. There are no shotgun prescriptions that I have found that are effective for all these parasites. And I don't know any way of making a quick, clean, positive diagnosis in these parasitic diseases of dogs other than to examine the feces and blood and skin—scrapings of the skin. I have dogs here showing some of these diseases. I brought the dogs with me. If any of you are particularly interested, any time during the afternoon I would be glad to prepare some blood specimens. It is not difficult; simply hack a vein in the ear, and you usually find the parasites.

People in our country are insuring dogs, and we should not think of passing a dog for insurance without examining the blood and feces. I don't see how a man can do otherwise, in fairness to all concerned.

We have a great deal of trouble with red mange. We did nearly everything that has been mentioned verbally or in written form, but had little success with it. About eighteen months ago someone told us about the treatment with arsenic. We happened to have a case on hand. We made a positive diagnosis, found the parasite, and treated the animal with 10-grain doses of arsenic and peroxid. We repeated this about four times, and followed each administration with oil given internally. The dog made a prompt recovery, and nothing else was done to it. We have the dog here. Since then we have tried that treatment on any number of cases and they have not gotten well, but

this dog is well. However, about six months ago we accidentally came onto a formula. I know you are tired of hearing of formulæ for red mange, but this one contained the following:

8 oz. kerosene,
8 oz. raw linseed oil,
1 oz. carbolic acid,
1 oz. oil of tar,
¼ lb. sulphur.

This has absolutely cleaned up all our chronic cases. This is not a pipe dream. I haven't an open case of mange, and I couldn't find one to bring here to show you the parasite. I have dogs that have been treated with this preparation. I know you are going to laugh about that formula, and I laughed about it myself, but it does the business. We apply this with mild rubbing about once a week. We have used nothing else.

DR. MILKS: Do you use precipitated sulphur?

DR. MARSTELLER: Just commercial sulphur. In fact, the man who gave me the formula said, "Use one ten-cent package of sulphur."

Most of these dogs we get are already clipped. I would like to show you a wonderful recovery. This is just a little cur dog. This dog was as splotched as the bulldog is. These places were raw. There were papule pustules all over these areas that you see, and for a long time even after she had haired out the skin looked pink, but that is all cleared up.

Here is another dog which has had about three applications of the remedy that I mentioned, applied about once a week. You can see she has begun to hair up and clean up, and you can't find any pustules on her—or I wasn't able to find any before she left home. These places were raw. I believe she is going to get well, as a number of others have.

DR. MILKS: How lately have you examined her skin with the microscope?

DR. MARSTELLER: We haven't examined her skin with the microscope since we began to treat her. I would be glad to have anyone examine her. As a rule we find after the pustules disappear and the hair begins to come out and the redness disappears we have no further trouble.

DR. MILKS: We have a great deal of trouble with mange. The dog looks typical of the ones that come in to us as to skin trouble, and you can find any quantity of mange.

DR. MARSTELLER: Her legs and all these places on the skin you see were hairless and were filled with pus and pus-like pustules, and there we found the mange mites, plenty of them alive. It may be that you can find some on her, but in looking over her hurriedly before leaving home I could not find any in the skin scrapings or could not find any pustules.

DR. HYDE: Will you make clear to the audience your modus operandi in applying the treatment?

DR. MARSTELLER: Take a soft cloth or paint brush and apply it; leave it on until you make the next application.

DR. QUITMAN: Dr. Marsteller said he used everything or nearly everything in the treatment of mange. I want to ask if he ever used plain, straight castor oil.

DR. MARSTELLER: I had failure with it.

DR. QUITMAN: I have had most brilliant results with it—just plain, straight castor oil—even where the skin had become thoroughly corrugated and thickened.

DR. MARSTELLER: We have had success in sarcoptic mange, but in the red mange we had no success with castor oil. I wouldn't say that dog over there is cured, but I believe she is on the way to recovery, though you may be able to find some mange mites.

Here is a specimen of an intestine covered with hookworm. It was collected from a bunch of fourteen pups, two of which died before they were sent to us, three died during treatment, and the others recovered after they were given carbon tetrachlorid.

Here are two bottles of tapeworms, all taken from one dog.

Here are 1,637 hookworms removed from a 16-months-old pup. They were removed by the usual dose of carbon tetrachlorid. We picked these out of the stool.

ANESTHESIA AND CÆSAREAN OPERATION—J. G. HARDENBERGH AND W. G. BROOK

CHAIRMAN FLYNN: Dr. Hardenbergh will demonstrate anesthesia.

DR. HARDENBERGH: The method of anesthesia which I wish to demonstrate is one which was perfected for us in experimental surgery, by which after preliminary etherization in a closed cabinet the dog is placed flat on its back on the operating table, the body in a straight line, and the tube is passed down the trachea.

I think it would be best for me to explain the method after we get over the preliminaries of the operation. I have some slides with which I will demonstrate the entire procedure followed.

DR. MERILLAT: How do you deliver the ether?

DR. HARDENBERGH: By passing the tube down the trachea. The dog breathes the ether in the open ether can with two outlets, one connected with this intratracheal tube, and the other with the open air. The dog breathes the ether vapor off the ether, which has a real lively high tension, and after the animal is thoroughly under it and the anesthesia regulated, it is entirely automatic. The dog can be maintained under complete anesthesia for an hour or more without further attention. It is a method adaptable to one man's technique when occasion re-

quires. It is one we feel is particularly adapted to those practitioners who have small-animal hospitals.

CHAIRMAN FLYNN: Dr. Brook will explain the operation he is about to perform and give you the technique in detail.

(Dr. W. G. Brook demonstrated the Cæsarean operation on a dog, explaining the technique and the various steps.)

DR. BROOK: In performing the Cæsarean operation, we perform it in a median line by making the incision from the umbilical opening down about two or two and one-half or three inches, depending on the size of the dog and condition we find the animal in. In operating I wear thin rubber gloves.

After you have made the external opening, find out which part of the uterus most of the feti are located in. In this case we have the majority of them in the right horn. We will endeavor to bring up this horn to the surface. In bringing the horn to the surface be very careful in manipulating so as not to tear the uterus, or that your finger nails don't go into the uterus proper.

We make our incision in this case at the bifurcation of the uterus, so that you can bring the fetus from the opposite side of the uterus out at this side. Pad the uterus well, so you don't get any of it back in the abdominal cavity. In making the incision into the uterus don't make too small an opening; make the opening large enough to bring the feti to the surface without tearing the uterus. You should remove one horn of the uterus at a time. Be sure to remove all placental membranes. We usually do this operation absolutely without any hemorrhage. If you attempt to remove the feti by manipulating with instruments and bruise the walls of the vagina, your operation will not be successful.

This operation is absolutely as successful as any one you can do, and it is not difficult to do at all. There is no reason why you should not do it. We do this operation very frequently and our results are very good; but we never attempt it after the walls of the vagina are bruised, for the simple reason there is a necrotic condition there, and the dog will get an infection and die in spite of anything you can do.

When you get ready to do the suturing in the uterus, be sure you have all the membranes clean, using a little iodin. Have your assistant stretch the uterus into normal position; after you get it into normal position, make an uninterrupted suture. In suturing use chromic catgut; you will find it more satisfactory. The first line of suture, through the serous and muscular coat, is absolutely covered up.

Let us consider the class of cases in which the Cæsarean operation is indicated. We find that the Bostons give us a lot of trouble in obstetrical work on account of the small pelvic cavity. I have been working for several years on instruments that would relieve that condition.

I have here two instruments that I have been using very successfully. You are perfectly welcome to examine them. Any tool-maker can make them for you, or an instrument company will make them at a reasonable price.

(DR. BROOK exhibited the instruments and explained their use in delivering the fetus in cases of difficult parturition.)

DR. BROOK (continuing): After you find that you can't relieve the animal with the instruments, don't manipulate her too much; resort to a Cæsarean operation. It is very successful when done under favorable conditions. If you find the animal's uterus is bruised a great deal, don't do a Cæsarean operation if you want to save the female, but resort to a complete hysterectomy at once. Don't try to use serum, because no doubt you have infection of the uterus at that time, and consequently the operation would not be successful. By doing a complete hysterectomy you will probably have no trouble and the patient will get well nicely.

After making an uninterrupted suture through the muscular and serous layers of the uterus we make what we call the Lembert suture, taking up the mucosa and muscular, bringing them in over the previous suture which closes up the uterus, and there is no danger of drainage into the abdominal cavity.

In doing this operation I do it mostly by myself, sometimes with one assistant. I use one grain of morphin, and I find under that you can do this operation very successfully. Occasionally you will have to resort to ether, but I always give morphin.

In behalf of Dr. Hardenbergh I might say that his method of anesthesia has been adopted in a lot of the schools, and by a lot of the practitioners, and it is very successful.

DR. FROST: Do you always operate through the median line?

DR. BROOK: I always operate through the median line. In making the incision through the median line you do not have the muscular tissue to bother you in making the suture after the operation, but you have plenty of room there to make the suture without interfering with the mammary glands. You can put the pups to nursing within twenty-four hours, just the same as if nothing had happened.

For bandaging after the operation I put a boracic acid pack over the wound, then a thin layer of gauze, and put a piece of cardboard over the line of incision, with a piece of tape between the teats, clear around the back—and that is all the bandage that is needed. After a few days the dog is liable to tear this down; it will begin irritating a little; then put on a medicated bandage. With careful attention the line of suture will heal within four or five days and you will have no further trouble.

A MEMBER: Is there any special after-treatment?

DR. BROOK: Nothing more than you would have in an oöphorectomy. In doing an oöphorectomy I do it entirely with a

headlight, an electric light. I make a small incision and throw the light, then I can see the horn of the uterus and see it very distinctly from any other of the structures. After you have located the horn of the uterus you can take any kind of a hook you like and reach in there and pick that horn of the uterus up and bring it to the surface through the small opening and remove the ovaries the same as any other method.

DR. FROST: Do you find an oöphorectomy satisfactory to the owner if the bitch comes in heat more than once repeatedly after the operation?

DR. BROOK: I do. Very often you will have a condition where there may be some disturbance of the ovaries, rupture of the cysts, carrying down into the broad ligament, and you may not be successful. By removing a large part of the connective tissue around the ovary you will be absolutely successful. However, there are cases on record, and I have had one instance, where after removing the ovaries the animal came into heat again, but it occurred only once, and that was the end of that. We do have that condition occur sometimes.

CHAIRMAN FLYNN: Didn't that occur where you operated just previous to the estrual period, just within a few days?

DR. BROOK: Yes, sir. You can't change the system that quick.

DR. STOKES: What disadvantage is the flank method over the medial method?

DR. BROOK: I have never resorted to the flank operation, but I have always contended that you have too much muscular tissue to deal with. You don't get healing as rapidly as you do in the median line.

I should advise every veterinarian who has the opportunity to take up with an M. D., who does a great deal of surgery, the matter of watching some of those operations. You have no idea what you can learn of surgery by watching the M. D.'s. In our city we have a medical college, and I attend clinic there very often and watch the different operations, with the courteous invitation of some of the M. D.'s; and you don't know what a help it is. You may get used to the different operations and resort to them in small animals. Your small-animal practice follows the human practice all the way through.

DR. TREMAN: I would like to ask if you have done the complete hysterectomy in sows?

DR. BROOK: My practice is not in the field where we have very much hog work to do, and I have never done Cæsarean or complete hysterectomy of the sow.

DR. BOWER: I would like to ask how you control hemorrhage. Do you ever do ligating in oöphorectomy?

DR. BROOK: In advanced pregnancy sometimes you will be called to do an ovarian, and you will find the animal pregnant In those cases I make a complete hysterectomy. It is a whole

lot easier, the animal recovers a whole lot better, and your operation consequently is more successful. As for controlling hemorrhages in those cases, I first ligate the arteries, the utero-ovarian arteries above the ovaries, remove the ovaries, and ligate the uterus, then go through the procedure I explained and make a complete hysterectomy. In the majority of ovarian operations I do not ligate the arteries; I use forceps in removing the ovaries by twisting them off.

CHAIRMAN FLYNN: Do you recommend this operation in practically all difficult cases of delivery?

DR. BROOK: Yes.

CHAIRMAN FLYNN: You consider they suffer less, and there is less chance of bad results, fatal results, in the operation than there is in the use of instruments in delivering the young?

DR. BROOK: There is less chance of bad results by using the operation. You will find that by using the instruments we have now you can have better success, but the old forceps we have been using, catching hold of the fetus, and the traction put on it more or less tearing it, proved an injury to the walls of the vagina; consequently you get an infection and the mortality is very high. By resorting to the Cæsarean operation, after you get familiar with it, you will find it a successful operation, and I would say 95 per cent of your cases will make a recovery.

I don't do this operation if somebody else has already made an attempt and bruised the vagina or uterus. After that I wouldn't go ahead and do a Cæsarean operation and tell the owner "I think she will get all right," for the majority of those cases will not.

DR. H. H. BROWN: What effect does this operation have on future pregnancy?

DR. BROOK: If you use the proper suturing material, chromic catgut or plain catgut, you will not have any trouble at all. The animal can go ahead and conceive the following season and come through without any trouble. I had one case in particular where a veterinarian had used silkworm gut, and in that case I had to do a complete hysterectomy in order to save the animal.

DR. H. H. BROWN: Would you advise complete hysterectomy prior to oöphorectomy?

DR. BROOK: You mean if she is pregnant?

DR. BROWN: In any case.

DR. BROOK: Your question is, if some one brings a dog to you and wants oöphorectomy performed. I do not perform hysterectomy; I perform oöphorectomy.

CHAIRMAN FLYNN: I want to thank Dr. Brook for his part of the program here, and also each and every one of the other men who have helped us out on this clinic. I want to repeat that the local committee—Dr. Darling, Dr. Jenneman and Dr. Ellis—have worked hard, and they have produced a number of very interesting cases.

OTHER CLINICAL CASES

CHAIRMAN FLYNN: We have two kittens here, shipped from Colorado. They are peculiarly afflicted. They are here for diagnosis. The field is open. As near as I can tell from the history that I have of those kittens, they have lost their equilibrium, and seem to be healthy otherwise. We presume this condition existed when they were born. They are Dr. Kingman's kittens.

Here is a dog that came to me a month ago. While tied with long rope, about three months ago, he chased neighbor's dog across the lot. He was thrown backward upon the sidewalk with great force. Within a few days after the tumble he showed evidence of pain while eating, which was noticeable for about a week; then for a week or ten days he appeared normal. Later it was noticed that the dog would prehend his food with his front teeth only, working the food back to the pharnyx with the tongue without mastication. This dog is unable to open his mouth any more than possibly an inch and a half or two inches. He was given an anesthetic at our place, and we were just as much unable to open his mouth after he was anesthetized as we are now. We have taken an X-ray of the head, and here are the two photographs. You can look at them, and if you find out anything about it, it is more than we could. This dog is here for diagnosis. He has been around in Kansas City to practically every veterinarian. The owner told me a few days ago that the head had begun to shrink. I presume it is the temporal muscles that are shrinking from lack of use. I notice on examination here now that the head is smaller than it was when I had him a few weeks ago.

Dr. Darling has a case here which he will explain; it is quite interesting.

DR. DARLING: This dog has a compound fracture of the lower jaw, and a lacerated wound on the tongue. This happened eight days ago. Supposedly the dog used to tease an old sow, and the supposition is that the sow snapped the dog. The dog is starting to take solid food in his mouth. He will make a good recovery, I think.

DR. FROST: What was the treatment?

DR. DARLING: There was not much treatment. We gave him rectal injections of beef broth and mutton broth. Today he is eating a little ground Hamburger, and we expect him to get better. There is a great deal of slough here on the lip. About one-third of this will slough off. He is a fine hunting dog.

Here we have a 9-year-old cat that had a fistulous opening on the cheek, communicating with the ear. If we had time the intention was to run a groove directly in there and open up the whole tract to see if we couldn't make a permanent repair.

We have a case here of an infectious venereal granuloma. You

see the watery condition around the sheath. That condition is of six months' standing and has received no treatment. We intended to cauterize that.

CHAIRMAN FLYNN: What is the treatment recommended?

DR. DARLING: Curetting and cauterizing; but there is a great tendency to recurrence.

DR. L. G. BROWN: Would you think it advisable to remove any of the prepuce?

DR. DARLING: I think you can save the prepuce in this case. Here is a small gland under the membrane; it is quite a common condition of the eye in dogs. A little cocain is injected and the gland is taken out very readily.

CHAIRMAN FLYNN: That is a very simple and satisfactory operation as a rule, and people are well satisfied with it. Dr. Darling recommended the use of a little cocain, and I believe by raising the growth up and nipping it off with nippers, usually in 24 to 47 hours you have practically a complete recovery, and the owner is very well satisfied.

That completes the small-animal program.

Adjournment.

FROM THE SECRETARY'S OFFICE

There will be a meeting of the Executive Board, at the La Salle Hotel, Chicago, Ill., Tuesday morning, December 5, at 10 o'clock.

A new supply of automobile emblems has been secured. All the unfilled orders which had accumulated while awaiting the new supply have been filled. Orders will now be filled on the day of receipt.

This is the year for the election of a member of the Executive Board from the First District, which includes all of Canada. A notice calling for nominations will be sent out shortly to all members in the First District whose dues are paid for the current year. Members whose dues are unpaid are not entitled to a vote.

Quite a few members in all of the districts have neglected to remit their dues for the current year. A second notice to such members will be sent out during the month of December. Members desiring to save the Association the expense of sending out this second notice should remit their dues immediately to the Secretary, P. O. Box 471, Detroit, Mich. Kindly make checks payable to the American Veterinary Medical Association.

H. PRESTON HOSKINS, *Secretary.*

OTHER MEETINGS

ARKANSAS VETERINARY ASSOCIATION

The Arkansas Veterinary Association convened at Little Rock on October 11 with a number of stock men and poultry men present as guests of the association.

A paper prepared by Dr. B. F. Kaupp, Poultry Investigator and Pathologist North Carolina Experiment Station, was read by Dr. Shull and was very favorably received.

Dr. Hubert Schull of Texarkana brought out many excellent points in the production of clean milk for the home and market, at the same time clearly demonstrating the immense services practicing veterinarians may perform in conserving public health.

At the evening session Dr. D. F. Luckey, Livestock Commissioner, Livestock Exchange St. Louis, gave an illustrated lecture on tuberculosis convincing his audience of veterinarians and stock men that tuberculosis causes considerable economic losses, is a menace to public health and that the merits of tuberculosis eradication work are such as to urge its early eradication. Dr. B. H. Ranson, Chief of the Zoological Division of the Bureau of Animal Industry, Washington, D. C., gave an illustrated lecture on common intestinal parasites of swine which was very highly instructive and interesting, especially the work relative to the life history of the common round worm.

A constitution and by-laws was adopted at the morning session on Ocober 12. A well prepared paper of Dr. J. S. Schilling of the State College of Agriculture on the preparation of material for laboratory examination prompted considerable discussion illustrating the import of the laboratory in arriving at a diagnosis of diseases or conditions.

President Wilson ably discussed infectious abortion of swine. His experiences corroborating that of others, namely, the importance of quarantine and sanitation.

Dr. H. J. Hayes of Helena briefly discussed barium chloride and its uses. The President suggested an open discussion in

which Dr. Hayes brought up the subject of tetanus, with discussions by Drs. Luckey, Schull, Kittrell and Wilson. Drs. Wilson brought up and discussed briefly the subject of swamp fever. After the election of Dr. Earl Kittrell as President and J. H. Bux, Secretary-Treasurer, the meeting adjourned.

JOE H. BUX, *Secretary.*

CONNECTICUT VETERINARY MEDICAL ASSOCIATION

The Connecticut Veterinary Medical Association held its quarterly meeting at the Hotel Elton in Waterbury, Wednesday, November 1. The following members and visitors were present:

Commissioner on Domestic Animals James M. Whittlesey, R. L. Smith, Inspector in Charge, Bureau of Animal Industry, Grove Loveland, V. M. Knapp, M. Ray Powers, Charles L. Colton, A. T. Gilyard, B. D. Radcliffe, A. W. Sutherland, F. M. Page, Harrison Whitney, C. A. Burnette, I. R. Vail, George T. Crowley, Benjamin Pennell, Thomas Bland, Peter T. Keeley, J. L. Devereaux, Edwin Laitinen, E. L. Thornton, Geo. E. Corwin.

Visitors: Dr. H. W. Jakeman, Pitman-Moore Laboratories; and Professor G. H. Lamson, Jr., Zoologist, Connecticut Agricultural College.

After the regular order of business a very interesting program was presented as follows: Fracture of the lower jaw of the dog, showing X-ray pictures, both before and after fixation with wire sutures, by Dr. Edwin Laitinen; Duties of the State Board of Examination and Registration, and Its Relation to the Association, by Dr. Charles L. Colton; Nicotine Sulphate: A Vermicide for the Sheep Stomach Worm, by Professor G. H. Lamson, Jr., Zoologist, Storrs Agricultural Experiment Station. Dr. Jakeman gave a very interesting talk on Antitoxins, Serum Therapy, and Immunology. All these cases and papers were of a very interesting nature and ably presented.

The advanced bulletin and information on "Nicotine Sulphate: A Vermicide for the Sheep Stomach Worm," by Professor Lamson, was the first information on this subject of its kind, and was an important adjunct to the program. The information it contained and the practical results given were ably presented.

GEO. E. CORWIN, *Secretary.*

NEVADA STATE VETERINARY ASSOCIATION

The association's semi-annual meeting for 1922 was held October 14, in Reno. More than 50 per cent of its small membership was present.

The forenoon session in charge of Dr. J. R. Beach of the University of California was devoted to a general presentation and discussion of poultry diseases.

After lunch the members attended the football game between Occidental College of Los Angeles and the University of Nevada on the MacKay Field of the University.

At six p. m. a buffet supper at the Women's Twentieth Century Club brought the members together again for the evening session.

A round table on cattle scabies, further discussion on poultry diseases and an exchange of field veterinary experiences occupied the evening.

S. LOCKETT, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

The President and Secretary of the B. C. Veterinary Association received copies of the proposed Milk By-Law of the City of Vancouver, from the City Medical Health Officer, inviting criticism and suggestions for improvement, to be presented at a meeting later. The Council proposed an amendment to the definition of the word "disease," which they considered inadequate, and on receipt of the invitation to attend the meeting, which was held in the courthouse September 27, Dr. Damman, as President of the B. C. Veterinary Association, was called upon to explain the amendment, which he did, and it was adopted. Other veterinarians took part in the discussion. The chairman was Dr. Young, Chairman of the Provincial Board of Health, and there were present Medical Health Officers of Victoria and Vancouver, members of the Vancouver Medical Association, Professor Sadler of the University of British Columbia, Mr. Berry, President of the Fraser Valley Milk Producers' Association, and other prominent dairymen and farmers, and also representatives of the City Health Department, and women's organizations, and the general public. The *Vancouver Province* devoted two columns next day to the meeting, in which the veterinary profession was given equal prominence with the other professions represented.

THE NEW ONTARIO VETERINARY COLLEGE

The official opening of the new Ontario Veterinary College at Guelph, Canada will take place on the afternoon of Tuesday, December 12. This date has been selected as the Guelph Winter Fair is being held at the same time. The official ceremony will commence at 2:30 in the afternoon followed by a banquet during the evening. While the list of speakers has not as yet been definitely decided upon it is hoped that the following may be able to attend and deliver addresses:—Hon. E. C. Drury, Premier of Ontario; Hon. Manning W. Doherty, Minister of Agriculture for Ontario; Hon. W. R. Motherwell, Minister of Agriculture for the Dominion, or his Deputy; Hon. S. F. Tolmie, M. P.; Sir Robert Falconer, President of the University of Toronto; Dr. J. G. Rutherford, Board of Railway Commissioners, Ottawa; Dr. F. Torrance, Veterinary Director General, Ottawa; Dr. J. R. Mohler, Chief of the United States Bureau of Animal Industry; President J. B. Reynolds, Ontario Agricultural College and W. B. Roadhouse, Deputy Minister of Agriculture for Ontario.

On an occasion of this kind it is not possible to send a personal invitation to every Veterinary Surgeon and this announcement should be considered as a cordial general invitation to everyone to attend, and it is hoped that many veterinarians and their friends will avail themselves of this invitation to be present at the official opening. This invitation is extended by the Department and by the Faculty of the College and it is hoped that a good representation from the profession will be present. Everyone is welcome and the college staff will be pleased to extend a cordial greeting to those attending. Keep the date in mind and decide to be present.

CALIFORNIA PRACTITIONERS' WEEK

The California Veterinary Practitioners' Week, arranged jointly by the California Veterinary Medical Association and the Division of Veterinary Science of the University of California, will be held at the University Farm, Davis, January 2 to 5, 1923.

Three special veterinarian lecturers from the East will be present at the meeting. Dr. W. E. Muldoon, from the Kansas

State Veterinary College, will lecture on "Therapeutics and Small Animals Practice." Dr. Adolph Eichhorn, from the Lederle Antitoxin Laboratories, will talk on "Rabies" and "Anthrax." Dr. J. F. DeVine, of the Goshen Laboratories, will talk on "Abortion and Sterility in Cattle and Horses."

Members of the staff of the College of Agriculture of the University will participate in the program, as well as a number of practitioners in the State.

The program has been arranged by the committee along the lines desired by the practitioners in California and a large attendance is expected. The course is open to all graduate veterinarians and such men in near-by states are cordially invited to attend.

NEW YORK CONFERENCE FOR VETERINARIANS

The fifteenth annual conference for veterinarians will be held at the New York State Veterinary College at Cornell University, Ithaca, N. Y., on January 11 and 12. An instructive program will be provided.

OHIO VETERINARY MEDICAL ASSOCIATION

The Ohio State Veterinary Medical Association will hold its annual meeting on January 31, February 1 and 2, 1923, consisting of one full day for papers and discussions, and also a full day devoted for a clinic. The clinic will be divided into five sections, namely for horses, cattle, hogs, small animals and poultry.

The business session will take place on Jan. 31 at the Deshler Hotel, where the annual banquet will be held on Feb. 1. The rest of the meeting, consisting of the clinic and the papers read will be held at the Veterinary Department of the Ohio State University.

This is to be a truly Ohio meeting, all taking part being residents of Ohio. It is also a meeting especially arranged for the practitioner, so all that attend can look forward to an instructive, as well as a good social and fraternal treat.

Out-of-State veterinarians are welcome; come and let us make you feel at home.

HARRY T. MOSS, *Secretary.*

COMMUNICATIONS

GREETINGS FROM CUBA

Havana, Oct. 27, 1922.

My dear and good friend Dr. Eichhorn:

Since I knew you were back from your splendid tour around Europe, I have been thinking to write you.

As you must imagine, I have read in the Journal your report of the trip to Cuba as delegate of the American Veterinary Medical Association to our National Congress, and you may be sure, Dr. Eichhorn, that all the Cuban veterinarians, and particularly those of the Army Service whom you met here, want to express to you their gratitude for what you have said in your report about the professional work that we are carrying on in Cuba with veterinary science.

The good relationship among the American and Cuban associations have been established through you forever, and the friends that your scientific and social characteristics have acquired while on your trip to this country are interested in your own success, thus adding one more page to our professional fraternity.

Allow me, then, to felicitate you in the name of my friends, and be sure of my personal devotion and reciprocal sentiments.

I remain,

Your devoted servant,

Angel Iduate,

President, Cuban Veterinary Medical Association.

A CORRECTION

To the Editor:

In your November issue on page 269 you quote me as saying "the more purebred blood coursing in the animal's veins the better able he was to stand the test." I wish to say that the word "purebred" should read "thoroughbred." Kindly make correction.

A. J. Savage.

Colorado Springs, Colo.

MISCELLANEOUS

THOROUGHBRED FIRST, MORGAN SECOND IN ENDURANCE RIDE

The fourth annual 300-mile endurance ride, conducted in mid-October under the supervision of a number of organizations interested in the development of horses with speed and endurance under the saddle, was won by Vendetta, a Thoroughbred mare owned by J. Watson Webb, of Vermont. Second rating was given to Gladstone, a purebred Morgan gelding bred and raised at the United States Morgan Horse Farm, Middlebury, Vt.

The course followed this year was entirely within the New England States, beginning and ending at Fort Ethan Allan, Vermont. At times during the ride weather conditions were severe. Out of a total of 21 entries only 9 horses finished the contest, the others having been taken out because of lameness, accident, or fatigue. Of the 6 horses that were awarded prizes, two were Thoroughbreds, one a purebred Morgan, one a grade American Saddle horse, one an Irish Hunter, and one a Thoroughbred-Standardbred cross. In the opinion of horsemen who witnessed the start of the ride, the entries this year were of better average quality and in far better condition than in any of the previous contests.

In this endurance ride the perfect score for speed is given for a record of 45 hours for the trip, or 9 hours for each of the 5 days. The longest time permissible for a contestant is 55 hours for the trip, or 11 hours for each day. Each horse carries 225 pounds and each rider is required to feed and care for his mount.

Of the 21 horses which started, four were Thoroughbreds, two were purebred Morgans, four grade Morgans, one purebred Arabian, six of Arabian breeding, one purebred American Saddle, one grade American Saddle, one Irish Hunter, and one crossbred.

The object of this endurance ride, which is approved by the War Department, the Chief of the Remount Service, and the Chief of the Bureau of Animal Industry, is to stimulate interest in good saddle horses, possessed of stamina, and hardiness,

and suitable for use in the mounted service of the United States Army. The annual endurance ride is managed by a committee made up of one representative each from the Arabian Horse Club of America, The Morgan Horse Club, The National Steeple Chase and Hunt Association, The American Hackney Horse Society, The Thoroughbred Endurance Test Club, The National Saddle Horse Club, The American Remount Association, The Horse Association of America, the Bureau of Animal Industry, other interested organizations, and the two donors of the prizes.

Gladstone, the purebred Morgan awarded second place this year, is a half brother to the famous Castor, Government Morgan that finished with very creditable records in the three previous rides. Both are by the stallion General Gates 666. Gladstone was the smallest horse to finish the contest, weighing at the start 924 pounds. He was foaled in 1913. Up to this fall he had been used at various jobs on the U. S. Experiment Farm, Beltsville, Md., and for some time as one of a pair on the carriage of the Secretary of Agriculture in Washington, D. C.

The following table gives the winners in the order of their rating on the basis of condition and speed:

Name	*Breeding*	*Weight*	*Total time*
Vendetta	Thoroughbred	1,012.5	45 hrs. 17 minutes
Gladstone	Morgan	922.5	45 " 58 "
Grant	Gr. Am. Saddle	1,185	45 " 25 "
Cragmore	Thoroughbred-St.	1,032.5	45 " 20 "
Pathfinder	Thoroughbred	990	45 " 34 "
Clonmell	Irish Hunter	1,050	45 " 20 "

PIG SURVEY TO COVER WHOLE COUNTRY

The second semi-annual pig survey, cards for which are now being distributed to rural mail carriers, will cover the entire country. The survey last spring covered only 17 States, but as an indication of present and probable pig production the survey was a great success and readily demonstrated the feasibility of extending the scope of the injury.

Ten cards or questionnaires will be distributed by each rural mail carrier on agricultural routes. Approximately 50,000 cards will be sent out. They have been prepared in simple form and can be filled out in a few minutes. Where possible, the mail carriers will fill in the answers as made by the hog raisers. The cards will show the number of sows farrowed during the last

six months of 1921, the number farrowed during the first six months of 1922, the number of sows farrowed, or due to farrow, during the last six months of 1922, and the number bred or intended to be bred to farrow during the first six months of 1923. Numbers of hogs which died from hog cholera or other diseases during 1921 and 1922 will be shown, as well as the number of pigs saved per litter.

The importance of this survey to the farmers in enabling them to adjust their production to the probable needs of the market is quite evident. People who deal in crops and livestock, such as packers and commission men, have very extensive organizations for informing themselves of the production of crops and livestock. Obviously information of this character is just as important to the farmers as to the people who deal in farm products.

DAIRYMEN FINANCE LOCAL FIGHT ON TUBERCULOSIS

In Lyme township, Huron County, Ohio, owners of dairy cattle organized an association through which they financed their own campaign against tuberculosis when State and Federal indemnity funds had run out. The members were assessed $2 a head for grades and $4 a head for purebreds, one-fourth being used for organization work and the rest for paying indemnities. The association has tested 83 herds containing 662 cattle, 26 of which reacted. The owners of the reactors received the salvage value of the animals and a straight indemnity of $20 a head for grades. For purebreds the indemnity was doubled. About 85 per cent of the herds in the township were tested.

The organizing of this association indicates the anxiety of many progressive dairymen to get rid of tuberculosis. These Ohio men might have waited for more funds to be appropriated by the State and Congress, but they felt they could well afford to pay out the money themselves to hurry the work and advertise their locality as free of the disease.

Dr. M. L. Olsen, a recent graduate of the Colorado Veterinary College, motored from Denver, Colo., to New Westminster, B. C., and has taken the examination to become licensed to practice in British Columbia, and has located at Duncans, V. I., B. C.

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

J. R. MOHLER, Editor, Washington, D. C.

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ON THE THRESHOLD OF A NEW YEAR

HOPE is said to spring eternal in the human breast. At the beginning of each new year in this period of depression and reconstruction we have always been buoyed by the hope that the next year would be better than the last. And so it has been, though the improvement has fallen far short of the hopes. Unmistakably, though with painful slowness, we are making our way back toward what a distinguished gentleman has termed normalcy.

Signs of better times ahead are becoming plainer. Agriculture, upon which the welfare of the veterinary profession largely depends, has made some progress toward recovery. In production 1922 was a big year, although continued low prices of farm products as compared with other commodities prevented a due measure of prosperity to the farmers. Also, for the first time in several years, the veterinary colleges in the United States and Canada show an increased enrollment of freshmen. An increase of 12 students is not large, to be sure, but it marks a turn in the tide. Other encouraging indications might be added.

So, with good reason, we continue to hope. And for the

coming year the JOURNAL extends to its readers its best wishes for their prosperity, professional advancement and personal happiness.

A CHANGE IN EDITORSHIP AND MANAGEMENT

DEFINITE ACTION was taken by the American Veterinary Medical Association at its last annual meeting toward putting into effect a change which had been under consideration and discussion for several years. The offices of Secretary of the Association and Editor and Business Manager of the JOURNAL were consolidated, and Dr. H. Preston Hoskins was elected to the combined positions. A full report of this action is contained in the proceedings published in this number. Soon after his election Dr. Hoskins assumed the duties of the secretaryship, but for reasons of business and convenience the transfer of the work relating to the JOURNAL was deferred until the first of the year.

The wisdom of the policy of which this change is a part is obvious. For several years the Association has had no fixed headquarters and the JOURNAL has led an itinerant existence, with rather frequent changes of editors. The degree of prosperity enjoyed under these conditions is probably more than could have been expected. The ideal of a permanent home and centralization of duties is commendable, and it is to be hoped that in due time the Association may be able to take the next step of establishing permanent headquarters in an office of its own.

After a tenure of three years the retiring Editor may be permitted to indulge in a few reflections. The editorial and business management of the JOURNAL, although beset with some difficulties and conducted along with the heavy duties of another official position, has been on the whole a congenial task and a pleasant experience. Efforts have been made to represent faithfully and to minister to the varied interests of the veterinary profession and at the same time to promote the advancement of the profession and the attainment of its ideals. Hearty cooperation and assistance have been received from many collaborators who have contributed valuable papers, clinical and case reports, abstracts, reviews, reports

of meetings, news items and other material. The attitude of the Presidents of the Association and of Secretary Mayo and other officers and members has been cordial and helpful. The patronage of our advertisers has been an essential factor in the financial prosperity of the JOURNAL, and has made possible a larger and better magazine than could have been provided otherwise. Printing firms have given sympathetic cooperation in making the magazine pleasing and creditable in appearance and in getting it out on time. All these collaborators, contributors and supporters are entitled to share in the credit for whatever degree of success has been attained, and to all of them our sincere thanks and appreciation are extended.

For the new Editor we bespeak a continuance of the same support and encouragement. Knowing well from experience the difficulties attending a transfer of management and office of publication, and the delay that may unavoidably ensue in the issuance of the first number under the new conditions, we ask in behalf of Dr. Hoskins the patient indulgence of the readers in case the February JOURNAL should not be received on time.

Let us continue to go forward in working together for greater things for the Association and the veterinary profession.

INTEREST AND ENTHUSIASM LARGELY DEPENDENT UPON THE ATTITUDE OF A PRESIDING OFFICER

THOSE who attend a meeting with the privilege of participating, usually join in the discussions and general proceedings in proportions to the interest they have in the subject in question, but with the inexperienced, even though he be full of enthusiasm, there is often in evidence an invisible restraining influence. The leaders and older members do not notice it, but the younger class are very susceptible to the attitude manifested by the presiding officer. He opens the assemblage according to Hoyle, and in a very scholarly manner discharges his duty preparatory toward plunging into the deep channels of the regular program.

Now, "Let's reason together," stop a moment and conscientiously reflect. How many meetings have you attended in which

only a few self-appointed members participated? Then, how many meetings have you attended where the majority took equal part and said all they had to say instead of remaining silent and furiously expressing their opinions to a small group of sympathizers, out in the lobby? All of us have witnessed these varying conditions and must agree that the former is far from being constructive. There is a reason for all of this, and a fundamental one. We can blame the members for neglecting to participate, because they certainly have an opportunity. However, let us not feel satisfied with such a frail excuse, but go deeper into the cause.

It has been well said that "timidity is the cause for the loss of a great deal of talent." Therefore we must contend with this factor and start remedial measures from the base of it. The average practitioner is seldom called upon to speak before an audience, consequently he must have a little encouragement. He is deeply interested and his brain is full of good, substantial ideas.

The writer recalls attending a large meeting not many years ago when conditions were suddenly reversed. The presiding officer, a very able man, opened the meeting in the usual manner and clearly pointed out the problems to be considered but he unconsciously spread over the gathering an atmosphere of reserve and fear which appeared to seal the majority to their seats, and was sure ultimately to overburden the presiding officer. The writer observed the effect, and immediately took the floor with a message of welcome and an appeal for closer fellowship, asking all to enter unhesitatingly into the spirit of the convention and voice their opinions whenever they felt like it. The change was phenomenal because someone had warmed the chill and offered them a welcome as we would in our home. Many men want to say something, but they are possessed with an indescribable fear which they cannot overcome. The leader can do much toward clearing the way by placing himself in their position, making it a point to encourage timid members and to see that they have a fair chance without being drowned out by the roar of those who are always conspicuous and never fail to shine at every opportunity. E. I. S.

OUR NEW EDITOR

READERS of the JOURNAL, meet Dr. H. Preston Hoskins, who assumes the editorial chair with the next issue.

Dr. Hoskins is well known to American veterinarians not only as the son of his distinguished and lamented father, Dr. W. Horace Hoskins, but also by virtue of his own professional work during the last twelve years. He is a native of Philadelphia, and after graduating from the Central High School in that city he attended the Veterinary Department of the University of Pennsylvania and received his veterinary de-

DR. H. PRESTON HOSKINS

gree in 1910. For a short time he engaged in practice with his father, then he accepted a position with the University of Minnesota as instructor and director of the hog-cholera serum plant. For the last six years he has been in the service of the well-known firm of Parke, Davis & Co., of Detroit, Mich., as veterinary pathologist on the medical research staff. He is a member and has served as secretary of a number of State veterinary medical associations and is a licensed practitioner

in the States in which he has resided. He is the author of a number of papers reporting research work.

His education and training, his wide acquaintance and his varied experience as practitioner, educator, research worker and writer give him exceptional qualifications for filling capably the duties of the combined positions of Secretary, Editor and Business Manager to which he has been called by his colleagues of the American Veterinary Medical Association.

MONTREAL, A CONVENTION CITY

MONTREAL was decided upon at the last annual convention in St. Louis as the meeting place of the next convention of the American Veterinary Medical Association. It is a city of wonderful growth and commercial importance.

The site of this city was discovered by Jacques Cartier 386 years ago and should that adventerous Frenchman come to life and visit the scene, he would be astounded at the growth of this metropolis of Canada. Samuel Champlain in 1611, when visiting the struggling hamlet, describes it as "a little spot which is as far as barques and boats can easily come up." Should this explorer now see this rapidly growing city, he would learn that although it is the farthest inland port in the world, being 1,000 miles from the sea, it is the nearest port to Europe on this side of the Atlantic, being only 2,773 miles from Liverpool, the next nearest being Boston with a distance of 2,810 miles. It is the greatest grain exporting port in the world, having in the seven months of navigation in 1921 shipped 138,000,000 bushels as compared with its nearest competitor, Galveston, with its 72,000,000 bushels. Also the grain handling and storage facilities of the port exceed those of any other port in North America, ships drawing 30 feet now coming in to the port at low tide—quite a contrast with Champlain's day.

We find among the names of those instrumental in developing this great harbor, that of John Torrance, who was a member of the Harbor Commission which made possible this splendid harbor and facilities for handling and shipping grain which comes like a flood from the rich prairie lands of Central Canada and northern United States. Our own Dr. F. Torrance is the grandson of John Torrance and he can look

with pride on the achievements of his ancestor, these wonders having really been worked out before his own eyes.

This Canadian city is an excellent convention city, has many fine hotels and our members and their friends will certainly be gratified to furnish entertainment to any and all if they should take their vacations next summer at the time of the annual convention and attend the meeting, thus combining pleasure with a highly profitable and instructive postgraduate course.

The effort made by some misguided people in California and Colorado to get anti-vivisection bills passed in those States, has met with defeat. The reports indicate that the proposed legislation was beaten in California three to one and in Colorado six to one.

Drugless healers, such as chiropractors, osteopaths, etc., are not entitled to permits for narcotics under the Harrison law, according to a ruling of a Collector of Internal Revenue in California. The collector's attitude seems to be much more consistent than that of the applicants for permits.

"The vigilance of our Bureau of Animal Industry and of the U. S. Consul at Kingston, Jamaica, has probably prevented an outbreak of foot-and-mouth disease in this country. Doubtless the Jamaica veterinarians realize by this time that it's never safe to monkey with foot-and-mouth. All of us should realize it in advance and thank our vigilant public servants who keep it out."—*National Stockman and Farmer.*

An enterprising Jap student at one of America's inland colleges, who landed here with practically no English in his vocabulary, secured a job on a farm during vacation season. He assimilated the language readily enough and soon had a workable command of words—enough to get by with; but the feminine nouns properly applicable to the various domestic animals came near proving a German Marne. One morning he came running in very great haste to the master of the house, gasping as he ran: "Please, honorable boss, come quickly—hen-pig, she have pups!"—*Everybody's Magazine.*

THE VETERINARY PROFESSION AS OBSERVED IN VARIOUS EUROPEAN COUNTRIES [1]

By A. EICHHORN, *Pearl River, New York*

DURING THE WAR and in the years following, only very meager information came to this country with regard to the activities of the veterinary profession in the various countries of Europe. It was, therefore, with the greatest of interest that the writer looked forward to a trip during the past summer to those countries in order to observe the conditions as they existed. The report of the American veterinarians who participated in the trip through European countries in 1914 in connection with the contemplated attendance at the International Veterinary Congress in London, and who had the opportunity of closely observing the veterinary institutions and other organizations pertaining to veterinary activities, contained the last exhaustive available information on the subject. The tremendous upheaval from the war, resulting in the breaking down of the economic conditions in many of the countries, and also the geographical changes occurring there, together with the difficulty of carrying out the thorough sanitary and police measures in the control of infectious diseases during the war, could not fail to have its effect upon the veterinary profession, the same as it had upon other lines.

From general information available, everyone is cognizant of the effect which the World War had on civilization, and we are now realizing that civilization has received a staggering blow from which it will not recover for many decades. Scientific activities which had the greatest momentum in the history of the countries at the time of the outbreak of the war were naturally sidetracked during the war, and due to the economic collapse in Europe there is little hope for an early recuperation along this line.

In the past we have looked upon European institutions as leaders in scientific research. We have considered some of the universities from their traditions as being great centers for learning along the various lines of professions. From observa-

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

tions made it is apparent that most of them will no longer command such an enviable reputation and will have to be content with their meager existence. I have in mind the great medical center of the University of Vienna, to which thousands of eager students flocked from every country to enjoy the teachings of the many famous men connected with the institution, which, however, now is destined to fight for its existence on account of lack of support.

The trip afforded the writer an opportunity to visit veterinary colleges and scientific laboratories for veterinary research and also inquire into the veterinary organizations in charge of all administrative matters in connection with livestock, sanitary measures, etc.

While there appeared to be no apparent changes in the veterinary schools, on close observation it was evident that no progress had been made since 1914, and as a matter of fact, in many of the veterinary colleges neglect was noticeable, which in some instances was even associated with more or less indifference on the part of the administrators.

The attendance in the colleges was practically up to the prewar level. In fact, immediately following the war there was an increase in the number of students matriculating in almost every veterinary college in Europe. This was due to the fact that the young men of matriculating age who desired to take up the veterinary profession were called to serve in the army and could enter the college only after the conclusion of the war. The present matriculation, however, appears to be again normal and is indicative of the prospects which the veterinary profession offers in Europe. This is of marked significance when compared with the very small attendance in our veterinary colleges. The veterinary profession in Europe still lures the youth as offering him an attractive profession with the possibility of a prosperous future.

The profession apparently offers a broader field there than in the United States. This would explain the confidence which the prospective student has in the profession. There is also a tendency in the curriculum of the veterinary schools to train the veterinarian for the positions which rightly belong to the veterinarian but which have been withheld from him because of lack of specialization. This refers particularly to vocations

in food and milk inspection, animal husbandry, research work, and qualifications for positions in pharmaceutical and biological laboratories.

With the possibility of training men along those different lines the veterinarian could not only obtain lucrative positions but the profession would attain a very enviable place, with its members attaining a recognition favorably comparing with that of other learned professions. It is along these lines that the veterinary schools, especially those of Germany, are striving to develop their activities, and the leaders are exerting all their efforts to prepare the students for these various fields of activity as they realize that such a trend is imperative for the welfare of the institutions as well as for the future of the profession. Thus, the departments of milk hygiene and animal husbandry are being especially well equipped to afford the student all opportunity to specialize in these lines. Very intensive instruction is given in laboratory work with the opportunity for specialization. Such tendencies have been observed in the older established veterinary schools, and no doubt the more recently created veterinary schools in the newly established countries will follow the example.

In the newly created countries veterinary schools are also being established, one in Czecho-Slovakia and another in Jugo-Slavia. I found that the respective governments will spare no effort to provide these institutions with the necessary equipment to enable them to graduate men of competence, as it is realized that an efficient veterinary organization for a country is of the utmost importance. This is a remarkable fact, since in almost every country of Europe the expenditures have to be restricted to the minimum, yet the governments do not hesitate to provide funds for any purpose which will tend to conserve and build up a livestock industry.

The veterinary colleges abroad are also engaged in providing postgraduate courses not only for the practitioners but also for veterinarians engaged in official capacities. These courses are usually of one to two weeks' duration and concentrate on one particular line of work. Thus in the past years many courses were given on abortion and sterility. Veterinarians who participate in these courses are given an intensive theoretical and practical training along these lines. They are

given advantages of clinical work and thereby at the conclusion of the course they can carry out the work in their respective localities. Such special courses would no doubt be of material advantage in this country, as they would afford a large number of veterinarians an opportunity to familiarize themselves with the work along those lines. By providing men with such knowledge they could go out into practice and carry out satisfactory work which at this time only a few specialists would undertake. Therefore, such postgraduate courses are very suitable means for training practitioners along certain definite lines.

The veterinarians in the various countries of Europe have not been affected by the depression so much as men engaged in other lines; that is, their services are in greater demand now than heretofore, which is due to the fact that the value of livestock has materially increased and also that the animal owners are realizing the advantages which result from the services of trained veterinarians. This became apparent especially in Germany, where a great number of former army veterinarians have to be taken care of, likewise those who returned to Germany from the former colonies and also from the other territories taken from Germany. They apparently all have secured a livelihood, and I have learned that the veterinarians in that country are doing comparatively well.

I failed to learn of any dissatisfaction on the part of the veterinarians that work which justly belonged to them is taken over by persons incompetent and untrained to perform it. This especially applies to the administration of biological products, which in this country is now greatly concerning the veterinarians. There was no time in Europe when biologics could be administered by laymen. It is regrettable that in this country conditions developed which enable laymen to administer even the most important and dangerous biological products. This in itself is a serious problem and should be regulated for the benefit of the veterinary profession. It seems that the veterinary organizations and the individual veterinarians could do a great deal along this line, and it may require concerted action to regulate this phase of veterinary practice. It appears incomprehensible that in outbreaks of infectious diseases laymen should be permitted to administer

dangerous products. Yet such is the case, and often disastrous results follow. Furthermore, the handling of products which may disseminate infections by untrained men is also a menace to the livestock of the country. This is fundamentally wrong and should not be tolerated.

The veterinary organization of our county, State and Federal governments has not as yet received the attention that it has in European countries. Aside from the various activities of the Bureau of Animal Industry in which veterinarians are engaged, there are only very few States where an effective veterinary organization operates. Likewise, municipalities, counties, etc., in various parts of the countries do not provide for veterinary service. Thus one can readily see that with the extension of an effective veterinary service to the many administrative bodies which should include such service, it would be possible to extend the scope of the veterinary profession very materially over what it is at this time. For the purpose of such expansions it would be, of course, very essential that our veterinary schools should adopt a curriculum to train the men along the various lines to which veterinary service should extend, and by doing so they will materially help in placing the profession on a higher level and broader activity.

Along the line of sanitary science and control of infectious diseases, very little progress has been made in the European countries since the war. No doubt all resources of the countries have been concentrated toward the prosecution of the war, and the former efficient control over some of the diseases has been carried out with more or less indifference. Hence, some of the infectious diseases which had been eradicated from some of the countries have again appeared as a result of introduction from other countries, whereas diseases which were kept in check have been on the increase and now require the closest attention to prevent further spread of these infections. Glanders is a possible exception, which, however, can not be placed in this class, inasmuch as it was very essential that during the war all measures be taken to guard against the spread of this infection to make the armies more efficient in their functions.

At the present time glanders is under control and is practically unknown in some of the countries. This must be con-

sidered a splendid achievement, especially in considering the movement of the horses during the war and the insanitary conditions under which horses were kept. It offers also convincing proof that with proper safeguards and control measures it is possible to check and eliminate certain infectious diseases. The ophthalmic mallein test together with the biological tests for the diagnosis of glanders have proven their effectiveness and these methods of diagnosis can no longer be questioned.

With regard to tuberculosis, very little progress is being made in the control of this affection. Isolated attempts in certain localities or by individuals are being made, but there is no concerted effort in any of the countries toward the control or eradication of the disease. The wide spread of the infection, together with the economic depression in the various countries, eliminates at this time any possible action along this line. In Denmark, with the splendid agricultural organizations, particularly in the dairy industry, a marked diminution has resulted, although definite signs of eradication with the present methods can not be hoped for. The only apparent uniformity existing in the different countries with regard to the control of tuberculosis consists in the elimination of clinical open cases, together with compulsory slaughter of all animals affected with tuberculosis of the udder. Tuberculin testing is carried out on a very limited scale, mostly at the request of private individuals but without any compulsory requirements of disposing of the reacting animals. In Great Britain the authorities aimed to introduce methods of controlling tuberculosis along the line of our accredited herd system, but for the time being this effort had to be abandoned on account of the lack of funds obtainable for that purpose.

During the war scabies was widely spread among the army horses, and while measures of control were carried out in the army, the disease spread to the horses owned by the civilian population. The spread of the disease has been checked by proper treatment of animals, which in some sections is still carried out in placing the animals into specially constructed cabinets and subjecting them to the sulphur dioxid gases. This treatment without a doubt has proven very effective and is one of the contributions of the war to our knowledge of treating diseases. More recently the same treatment has been ap-

plied to canker of the foot in horses with very effective results.

Infectious anemia in horses also became widely spread during the war, and now hardly any country of Europe is free from this disease. In some sections it is very prevalent, and our vague knowledge of the disease makes its control a difficult task. No method of diagnosis has as yet been developed, and positive proof of the presence of the disease can be established only by test inoculation of horses. This fact renders the control of the disease very difficult. The writer's attention was called to more recent experimental work along this line by Jaffre of Vienna, who claims that he has successfully transmitted the disease to rabbits, which develop a characteristic febrile condition and subsequently also lesions in the liver in the form of deposits of a pigment. These lesions are supposed to be characteristic of the disease. The opportunity for studying this infection was afforded to this investigator during an outbreak of the disease among the serum-producing animals of the Governmental Serological Institute of Austria. Before the disease could be controlled more than fifty horses died of the infection, which was a serious blow to this Institute, inasmuch as on account of the serious economic condition the replacement of these horses was a financial problem.

In localities infected with anthrax the control proceeds along the same lines as in this country, consisting of the ordinary sanitary measures together with the vaccination of the susceptible animals. The vaccination in the different countries consists of either the double vaccination or the simultaneous treatment with anti-anthrax serum and vaccine.

Rabies is more widely spread in Europe than it was before the war, and while muzzling laws are in effect in almost every country, and the police authorities are very strict in the enforcement of the law, neverthless, the disease is not being checked, which is no doubt due to the fact that a large number of stray dogs are permitted to run at large, and also that the muzzling law has never proven sufficiently effective to control the disease. Great interest has been manifested in the protective vaccination against rabies, but it is doubtful whether at this time any of the countries could undertake such a task.

The subject of hog cholera control is of special interest to American veterinarians, inasmuch as it is generally recognized

that hog cholera is the most important disease of swine, and many veterinarians in the United States, especially in the Corn Belt, are mainly engaged in the control of this infection.

Hog cholera is prevalent throughout Europe. Especially where hogs are raised on a large scale the disease is more extensive than in those countries where hog-raising is not an important industry. The countries in which hog cholera prevails to a great extent and is responsible for great losses are Hungary, Jugo-Slavia, Spain and Portugal. Nevertheless, in all other countries hog cholera is also being recognized as one of the principal infections of swine. The control measures adopted for the suppression of the disease vary in the different countries and are limited to compulsory reporting and prohibition of shipments of animals from the infected premises. Prophylactic vaccination has not as yet been adopted to any great extent in the various countries of Europe, although anti-hog-cholera serum has been in use in many of the countries since its discovery in the United States. Progress in the control of hog cholera by vaccination has no doubt been retarded in European countries as a result of the failure of adopting the simultaneous method of prophylactic vaccination. It is only very recently that this form of vaccination has been adopted in some of the countries and the superiority of this method over previous efforts to control the diseases with serum alone is now recognized.

Every since hog-cholera serum has been employed the general practice has been to use it in herds where the disease already existed. In such instances the serum was administered to the well and slightly affected hogs, permitting them to remain on the infected ground in order to bring them in contact with the virus during their state of passive immunity. It was assumed that the virus thus taken up would convert the passive immunity into an active form. The fact, however, that such is not always the case, and furthermore that the control of the infection is in herds where the disease has already existed, would naturally greatly diminish the effectiveness of the vaccination. With the experience gained in hog-cholera immunization in the United States, it is not at all surprising to us that the form of vaccination practiced in Europe would not give the best results.

The simultaneous vaccination as practiced in the United States is, of course, known to the authorities in Europe, but has not been adopted for the reason that some fear was entertained that the general use of the virus might be responsible for the spread of the disease and its continuous propagation. In many of the countries it is now recognized that the exception taken to the use of the virus is not well founded, inasmuch as the disease is very extensive, and besides, proper control could be exercised over the virus to be used in connection with the simultaneous vaccination. In view of the splendid results obtained with the simultaneous vaccination in the United States, this form of vaccination is now being introduced in several European countries, and inasmuch as the results obtained therefrom are so much superior to the serum-alone treatment, there is no doubt that the general adoption of the simultaneous treatment will soon be practiced in most of the countries of Europe. Heretofore in cases of outbreaks of hog cholera the animals were given the serum treatment, and since in most instances the immunity produced was only of short duration, it was necessary in many cases to repeat the vaccination in two or three months, at each time considerable losses having been sustained. Such practice is not only costly but also discouraging to the hog owners.

In one fattening establishment in Hungary with a capacity of 65,000 hogs the practice was to install the stock hogs when they weighed approximately 75 to 100 pounds. The establishment being infected with hog cholera virus, these animals contracted the disease within two or three weeks after installation. As soon as the disease appeared the animals received the serum treatment and were permitted to remain in the infected pens. Naturally the result was a considerable loss. It is known that some of the animals still retained a certain susceptibility to the disease, and after the passive immunity had vanished and the animals were subjected to heavy exposures they developed the disease. Thus the losses in this fattening establishment from hog cholera were estimated to be annually between 20 and 25 per cent. It is remarkable that under such conditions the proprietors have not taken advantage of the simultaneous vaccination of all hogs installed there, which would practically have eliminated the losses from hog cholera.

The manufacture of hog-cholera serum has also not progressed to the degree of perfection with which this product is now being prepared in the United States. At this time the production is limited to three countries in Europe, and they have not as yet employed the more up-to-date practice in order to insure a safe, potent product. The hyperimmunization still consists in the injection of the virus subcutaneously, which has long been discarded in the United States for the more effective method of intravenous hyperimmunization. The tail bleedings are also received in open vessels, without the application of vaccum, which results in frequent coagulation of the blood on the end of the tail. The subsequent removal of the fibrin with plugs of cotton and the hitting of the tail with a stick or piece of rubber tubing is still used to facilitate the bleeding. Such conditions, of course, make it difficult to obtain a serum free from contaminations which may at times be very harmful. The number of bleedings taken from an animal are also not regulated. In some establishments after the hyperimmunization five, and in others as many as six or seven bleedings are taken, which from experience in this country and the experiments conducted by the Bureau of Animal Industry could not produce a highly potent serum. All serum used in Europe is clarified and concentrated.

Dourine also spread among the horses during the war. It is now very prevalent in countries where it never existed or from which it had been successfully eradicated. Efforts for its control now are directed toward eradication and consist of diagnosis of the infection by the complement-fixation tests. In some of the countries affected horses are subjected to treatment, for which purpose a special preparation known as Beyer 205 is being employed. Its action on the trypanosome in dourine is supposed to be the same as the action of salvarsan on the *Treponema pallidum* of syphilis. Many publications from scientific institutions and veterinary colleges report complete recoveries following the use of this product. In those localities the infected stallions are castrated and the other infected animals are sent to work in mines where there is no opportunity for utilizing them for breeding purposes.

Abortion disease in cattle is also a serious problem in the European countries. The disease is very common, causing

tremendous losses in some of the higher developed stock-raising countries. Research work is being conducted in many of the countries, but our knowledge has not been furthered recently from these sources. In the Imperial Board of Health of Germany considerable experimental work has been conducted on this disease. The results of Dr. Zeller's experiments are of particular interest, in which he failed to recover organisms of *Bacillus abortus* from the feces, urine, etc., of animals six weeks after the injection of large doses of living cultures. The results of the experiments to control the disease with live organisms as conducted by the same institution are well known, as they have received considerable publicity in America. The findings are noteworthy, inasmuch as the experiments have been conducted on a sufficiently large scale to justify dependable conclusions. The following is a summary of these investigations:

1. Dead organisms. Both in nonpregnant and pregnant cows some degree of immunity is produced. It is, however, of low degree and of short duration. For example, many cows did not abort at the first calving after this method of treatment, but did so at the second.
2. Dead organisms plus serum. Similar conclusions to those of dead organisms alone.
3. Living organisms. Better results in all circumstances than with dead organisms. Of 128 cows so treated which had previously aborted, and were therefore definitely infected, only 6 aborted afterwards. Better results were also obtained in preventing abortion in cows which had not previously aborted but were in contact.
4. Living organisms plus serum. In the case of nonpregnant cows the results were as for living organisms alone. This method was also proved useful for the prevention of abortion in pregnant cows; in fact, this method caused as great a reduction in abortion among pregnant cows as did living organisms alone among the nonpregnant ones.
5. Controls (plain broth). Among the animals not inoculated there was an increase in the number of abortions from 175 to 245.

The opinion seems to prevail that in the infectious form of abortion 90 to 95 per cent of the outbreaks are due to the *Bacillus abortus* of Bang. The significance of the bull in the transmission of the disease is given minor or no importance.

During the trip through Germany the writer had the opportunity to see cattle which were shipped from Texas to Germany as a donation from some philanthropic sources. These cattle were sent for the purpose of providing breeding stock for milk-producing animals, and therefore were not supposed to be slaughtered for food purposes. The first shipment arrived in

Bremen during March, 1921. They were quarantined with the view of ascertaining whether they were affected with piroplasmosis. The transmission tests on the first injection proved positive and there was no difficulty in proving the infection in the cattle shipped to Germany. Anaplasmosis was also found, which was successfully transmitted by the Ixodes ticks which are common in Germany. After determination of the piroplasmosis in the cattle the Department of Agriculture in Washington was advised by cable of this occurrence, and in reply the authorities at Washington suggested that there are probably no ticks in Germany which would transmit the Texas fever parasite. As a matter of fact the transmission experiments with *Ixodes ricinus*, the most common tick in Germany, failed. In one instance, however, anaplasmosis was transmitted by these ticks from the American cattle. Some of the American cattle died from Texas fever. It is regrettable that prior to the shipment of these cattle measures were not taken to determine their condition so far as their infection with piroplasmosis was concerned, especially so as these animals were supposed to be used for breeding stock.

Contagious pleuropneumonia in cattle has also given great concern to many of the countries where the disease has not existed for many years, due to the introduction of the infection during the war. The problem of guarding the noninfected territories from the infection has given the veterinary authorities a great deal of concern. Because of the insidious nature of the disease and the difficulty in diagnosis, it has been difficult to guard against the spread of the infection. At the same time laboratories have undertaken experiments in order to devise practical means of diagnosing the disease, and it is to the credit of the laboratories of the German Imperial Board of Health that they have developed a method whereby diagnosis with the aid of a biological test has been made possible. They have succeeded in developing a medium in which a more concentrated growth of the virus is obtained. In the cultivation of the virus they have found that the reaction of the medium is of the greatest importance. The medium consists of ordinary bouillon plus 8 per cent horse serum to possess 7.8 to 8.0 pH reaction. They found that the virus has a great affinity for alkalinity. With this increased growth in the medium they

succeeded in preparing a product along the same line as tuberculin is prepared. Subcutaneous injection of this product induces a thermic reaction in cattle affected with pleuropneumonia. Postinjection temperatures are taken every two hours, the first temperature two hours after the injection. The practical results from these tests have proven very encouraging and reliable, so much so that the laboratories are now furnishing to the Czecho-Slovakian Government the product for testing all animals imported into that country. In this manner they hope to eliminate the introduction of animals affected with the disease, which without such a test would be almost impossible unless long periods of quarantine were enforced. The virus in the concentration cultivated in the laboratories referred to is also suitable for the preparation of an antigen which has been very successfully used in the complement-fixation tests for the diagnosis of this disease.

The most significant achievements, however, in recent years must be considered beyond a doubt the results in the efforts made to cultivate the foot-and-mouth disease virus. The credit for this is due to Professor Titze of the Imperial Board of Health Laboratories. Foot-and-mouth disease has been very extensive all over Europe in the past few years and only recently showed a tendency toward diminishing. In many of the affected countries considerable research has been done in attempts to shed more light on this very serious infection. Only recently Great Britain has provided a battleship for the study of the disease, which has been equipped with the most up-to-date apparatus for research, and very competent trained men were provided to take up this work. Unfortunately they have failed in accomplishing anything definite or in adding to our knowledge on the nature of the disease. On the other hand, in the German laboratories Titze has apparently now succeeded in cultivating the virus, which accomplishment will no doubt have a great bearing on the control of the disease. He succeeded in cultivating the virus in culture tubes up to the one hundred and sixty-fourth generation and in proving the virulence of this virus up to the forty-first generation on guinea-pigs. Furthermore, immunizing experiments with this virus have also been successful, and the fact that the cultures may be utilized as an antigen in biological tests is also a substantiating factor of its successful cultivation.

Another interesting feature in the research with this disease proved to be the propagation of the virus in guinea-pigs. I have personally observed guinea-pigs in which the virus has been propagated for 122 generations. Heretofore we have thought that it was impossible to transmit the disease to guinea-pigs, whereas now it has been found that it can be transmitted regularly by scarifying the pads on the feet and then applying the virus. In 24 hours typical vesicles developed on the feet of these guinea-pigs, so much so that the disease can be recognized at the first glance. The disease also frequently develops in the mouth of the infected pigs. This experimental work unfortunately can not be carried out now on so large a scale as would be desirable, on account of lack of funds, it being impossible to purchase the necessary number of large animals desirable for the work.

Just a few words with regard to the livestock situation of Europe. There is undoubtedly less livestock in Europe at this time than prior to the war, although rapid strides are being made in many of the countries toward increasing the livestock to its highest level. The depletion of livestock is most noticeable in the central and eastern countries of Europe, and not only is there a decrease in the livestock but also the quality has suffered. In Germany, Austria, Hungary, Czecho-Slovakia and Rumania they have considerably less livestock than prior to the war, and the countries which were compelled to deliver livestock to the victorious nations suffered a considerable depletion of their choice breeding stock. As a result it will require many years to stock up these countries again with higher grade animals. In some of these countries, particularly Rumania and Jugo-Slavia, this may not be accomplished for generations to come, inasmuch as the large estates have been cut up and sold to the peasantry. These farmers will not be in a position to improve their livestock because of the lack of capital and also lack of understanding of the advantages of better breeding stock. The governments also are not able to give material help to the small farmers for some time to come on account of the economic upheaval existing in many of the countries. Thus it is apparent that not only the livestock industry but agriculture in general will not advance for years to come in many of the European countries. This only sub-

stantiates the views of some of the greatest economists that in consequence of the conditions in many of the countries in Europe the United States will experience agriculturally a long era of the greatest prosperity in its history.

Since agriculture and the livestock industry go hand in hand with veterinary activity, we should look forward to a bright and prosperous future for the veterinary profession. Furthermore, the United States, being now the only country not materially affected by the ravages of the war, should be in a position to carry out extensive and intensive research work along the line of veterinary problems. The European countries are now realizing that the leadership in many of the scientific activities is passing from their side to this side of the Atlantic. We should take advantage of this opportunity and carry on the work in the right spirit and with a full knowledge of our responsibility.

VETERINARY GRADUATES

The total number of men graduated from accredited veterinary colleges in the United States during the last 15 years is as follows:

Year	*Number of graduates*
1908	469
1909	569
1910	748
1911	806
1912	735
1913	644
1914	684
1915	698
1916	734
1917	774
1918	867
1919	214
1920	375
1921	267
1922	153

THE VETERINARIAN IN POULTRY PRACTICE

By BERNARD A. GALLAGHER
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THE MOVEMENT within the veterinary profession toward a broadening of its activities to cover all of our domesticated animals is a welcome development of the past decade. Whether this expansion is due to natural evolution, economic causes, higher education, increasing demand from livestock owners, or a combination of circumstances, its effect has been most beneficial to both the profession and the livestock industry. That the domesticated birds are not being slighted in this movement is shown by the increased attention given to poultry diseases by veterinary colleges, State experiment stations and other institutions, by the number of articles on the subject carried by the journals, by addresses at veterinary meetings, and by the constantly increasing number of inquiries coming from practitioners who seek aid in the diagnosis and control of disease outbreaks which they are called upon to treat.

The census report of 1920 shows that 473,301,959 chickens were raised on farms in the United States in 1919. The value of these and the eggs produced was $1,047,323,170. In addition approximately 25,000,000 of other kinds of poultry were produced. It is not difficult to see that an industry of such magnitude holds possibilities for the veterinarian which he should be prepared to cultivate. While the value of an individual fowl is comparatively small, the tendency of infectious diseases to destroy a large portion of the flock or cause a decrease in egg production makes the total monetary loss a considerable item, and often means failure to the man who is making poultry raising a business. It is quite apparent to those in touch with the situation that diseases of various kinds are extremely common in domesticated birds, and that the losses sustained are very great.

The demand for Bureau of Animal Industry bulletins on poultry diseases and a heavy correspondence show that owners of fowls are as a rule anxious for help in their difficulties, and they would no doubt gladly avail themselves of the services of the veterinarian were they aware that he included poultry in his

practice. The veterinarian on the ground is in a more favorable position to render effective assistance than is one at a distance who attempts to diagnose a disease from inadequate information received by letter from a layman. Such information too frequently consists of a simple statement to the effect that the fowls are sick or dying and that a remedy is desired. In other instances symptoms are given which are common to several diseases or merely indicate that the birds are sick. However, in many cases distinctive symptoms, history of outbreak, age of fowls, rate of mortality and autopsy findings are detailed, and these point the way to a definite diagnosis. By familiarizing himself with the more important diseases of the domesticated birds and showing an interest in the flocks of his clients, the practitioner can not only broaden his practice but also render a distinct service to his community.

Until recent years there was no extensive demand for professional attention for diseased flocks, owing to the low value of chickens in the past, the indifference of veterinarians toward poultry practice, and the failure of the layman to realize that, like other animals, fowls are subject to a considerable number of infectious and parasitic diseases. Even with authorities on poultry husbandry the tendency has been to attribute abnormal conditions and deaths to faulty feeding or management, except in cases that showed outward pronounced lesions, as in roup or chickenpox, or where the mortality was high enough to suggest cholera. It is safe to say that among barnyard fowls that run at large the customary method of feeding or variety of the feed has practically no bearing on the incidence of disease, provided that the materials ingested do not harbor disease-producing organisms or bacterial toxins or ptomains. Also among birds in large flocks with limited range there is but a remote possibility of disease being due to dietetic causes, since it is customary to give the fowls grain, green feed, animal matter and inorganic material, which contain all the elements necessary to the nutritive requirements of the animal body.

These statements do not apply to those purely organic conditions seen in young chicks closely confined and fed exclusively on feeds which are deficient in inorganic salts, proteins or vitamins or to older confined fowls which receive a limited diet rich in starch. It is a well-established fact that birds placed on a diet of corn meal or polished rice alone, for instance, will de-

velop a condition known as polyneuritis, as a result of malnutrition. This, however, seldom occurs in the customary feeding of poultry, except in the case of brooder chicks closely confined.

Among the more important diseases of fowls are bacillary white diarrhea of chicks, roup, chicken pox, tuberculosis, coccidiosis, cholera-like diseases, cholera, fowl typhoid, and blackhead of turkeys. There are a large number of other disorders, but they do not affect a large number of birds as a rule and usually are not attended with high mortality.

The determination of the specific nature of the disease from symptoms exhibited is in some cases quite difficult or impossible. Diseases of a septicemic nature are especially difficult of differentiation, since sick birds present much the same general appearance. There is droopiness, listlessness, roughing of feathers, and general weakness manifested frequently by weakness in the legs.

From a practical standpoint an exact diagnosis is not of supreme importance in some of the diseases, as the method of handling the outbreak would be the same whether the disease were cholera, typhoid or one of the septicemias of a similar type. In those diseases for which specific treatment is available and where special ways of control are necessary it is, of course, important that the specific nature of the trouble be discovered.

The rapidity with which successive fowls become affected, duration of symptoms and degree of mortality may serve as an aid in determining the disease, at least as to whether it is an acute septicemic disease, a less acute disease such as coccidiosis, or a chronic disease such as tuberculosis. For a definite diagnosis a postmortem examination will usually be found necessary, and even this may not always reveal the exact cause. A laboratory examination is frequently required for a specific diagnosis.

Of course there are conditions which are readily determined by external symptoms, such as roup, chickenpox, scaly leg, favus, depluming scabies, and others of minor importance. Other external symptoms serve as guides in placing the trouble in a certain class of diseases. For instance, a pale comb would suggest tuberculosis, coccidiosis, leukemia or fowl typhoid, while a congested or dark-colored comb would indicate cholera or the cholera-like septicemias, pneumonia, enteritis, or blackhead of turkeys. Swelling of the joints and lameness would suggest

tuberculosis or gout. Emaciation is observed in tuberculosis, visceral gout, aspergillosis, internal tumors, anemia or leukemia. Convulsions might indicate poisoning. Death of a large number of fowls in a short time with no previous signs of disease would point strongly to poisoning by bacterial toxins, ptomains or mineral poisons. Diarrhea is present in so many conditions that it does not have a very great diagnostic value. However, bloody droppings may be present in coccidiosis of baby chicks. In cholera the droppings are of a bright yellow or bright green. They may show varying shades of yellow or green in other diseases. A postmortem examination can readily be made in chicken disease outbreaks, and where the more characteristic lesions of the various diseases are known a sufficient insight into the nature of the disorder may be gained to point the way to a method of control.

There are usually enough lesions available on postmortem examination for the determination of the more important diseases. Tuberculosis is quite easily recognized by the nodules on the liver, spleen, intestines, and often on other organs or parts. It might be confused with tumors of various types. However, in tuberculosis nodules there will be found yellowish cheesy centers or points, while in tumors the cut surface will be homogeneous or show degenerated hemorrhagic areas. Chickens affected with coccidiosis exhibit enlarged ceca containing a necrotic exudate. In enterohepatitis of turkeys there are yellowish or greenish areas on the liver, and enlarged ceca with necrotic contents. Aspergillosis is indicated when greenish or necrotic areas are found in the air sacs and lungs. In fowl typhoid and leukemia the liver and spleen are usually greatly enlarged and filled with necrotic spots. There is generally an absence of inflammation in the intestine. In cholera and the cholera-like septicemias the mucous membrane of the first portion of the intestine is inflamed and there are frequently minute whitish spots on the liver and punctiform hemorrhages on the heart. In *Bacillus pullorum* infection in hens the ovary contains hard, angular, discolored ova. Enteritis is common in birds and may be associated with a septicemic disease or may be nonspecific. In the latter case no general outbreak of disease in the flock would be in evidence. Pneumonia does not occur extensively in the flock, and is easily recognized on postmortem examination.

The course, lesions and results of disease in birds naturally

correspond with those observed in other animals, but present some variations. Birds as a rule do not show any marked resistance to the more infectious diseases to which they are susceptible, as a large percentage or practically the entire flock may become infected upon exposure. Their ability to recover from a virulent disease is also limited, and the mortality is usually high. They are, however, highly resistant to many infections which attack other animals, such as the pyogenic organisms, anthrax, tetanus, etc. Fowls often may be severely affected with a disease without disclosing noticeable symptoms as shown by the frequent death on the roost from septicemias, coccidiosis and other diseases, when the birds were apparently in good health and feeding as usual on the previous evening.

Purulent exudates are seldom observed in birds. Instead of pus, necrotic and cheesy formations are developed. These are especially apparent in the exudative diseases of the head, tuberculosis, enterohepatitis and coccidiosis. There is a marked tendency in birds to increase greatly the leucocyte content of the blood in infectious diseases, especially in some of the septicemias.

Fowls show considerable tolerance to drugs or substances of a toxic nature. From the results of experiments which were carried out by the writer with a large number of preparations it appears that in general grown fowls have approximately the same susceptibility to the toxic substances as have medium-sized dogs. They are more resistant than dogs to substances such as calomel, strychnin and tartar emetic, and less resistant to carbolic acid, salicylic acid and potassium cyanid. It was also shown that fowls are not visibly affected by drinking solutions of bichlorid of mercury 1-6,000, carbolic acid 1-1,000, permanganate of potash 1-500, or crude catechu 1-500 substituted for drinking water for periods of eighteen to twenty-one days. In connection with these experiments it was interesting to note that the crop not only serves as a reservoir for food, but that absorption through its wall is very rapid, symptoms appearing in from two to five minutes after the administration of such substances as ammonium chlorid in solution, potassium cyanid and strychnin sulphate. All doses in the experiment were given when the crop contained a normal amount of food.

The control of disease in poultry presents problems of a somewhat different character from those encountered in the control of disease in other domesticated animals. This is due to several

causes. Because of the close association of fowls in flocks an infectious disease which gains entrance to the premises is likely to spread rapidly and affect many birds by the time symptoms become apparent to the owner. Also fowls seem to show less resistance to their natural diseases than do other animals to theirs, and the percentage of affected ones which recover in severe outbreaks is less than is the case in outbreaks of disease among larger animals. It is obvious that the same care of nursing that is part of the routine procedure in dealing with other animals can not well be given to fowls. The value of the average fowl does not warrant the time consumed and the cost of treating each one separately, hence individual treatment is not practicable in cases where a large number of birds are affected. In so far as possible, therefore, measures must be adopted which will do the greatest good through treating the flock as a whole.

In mass treatment the feed and drinking water are utilized to a large extent as a means for administering medicine, and it is fortunate for the success of this method that fowls are not very critical in their taste, otherwise treatment would be very difficult. In controlling outbreaks of infectious diseases the first effort should be to separate the sick from the well as soon as symptoms become apparent. The ideal method is to remove the birds not showing symptoms to new quarters, but of course this is usually not practicable; and then, too, since all in the flock are more or less exposed, and many may have the disease in the incubation stage, a series of removals might be required. The best way to combat an outbreak is to destroy the first birds which show symptoms. If the poultry owner attempts to treat such birds there is great danger of carrying infection from the sick to the healthy in handling or feeding. Where the outbreak is established, however, a line of treatment should be undertaken when possible. With some diseases, especially those of a septicemic nature, such as cholera and the cholera-like diseases, fowl typhoid, tuberculosis, aspergillosis, and blackhead of turkeys, treatment of affected birds is of little value, and prevention by separation of the sick, and hygienic measures, including disinfection, must be depended on to keep infection as low as possible.

Preventive measures include daily removal of the droppings from the houses, and frequent disinfection with such disinfectant as 5 per cent carbolic acid, 2 per cent compound cresol

solution or 10 per cent formaldehyde solution. The use of permanganate of potash in the drinking water tends to prevent the spread of infection by means of the water and is generally advised as an aid in prevention. It may be safely used in a 1-2,000 solution. Therefore, the general methods to be followed in handling outbreaks of infectious diseases are separation of the fowls showing symptoms, after which they may be given special treatment or be destroyed as desired; careful cleaning and thorough disinfection of the houses and all feeding and drinking vessels and other utensils, and the placing of permanganate of potash or other antiseptic in the drinking water. It is also advisable to give the entire flock a dose of Epsom salt in the proportion of ½ teaspoonful to each adult bird. The amount required may be mixed in a sufficient amount of mash for one feeding. It is best to give it in the morning, as the crop is then nearly empty.

Precautionary measures will do much to keep fowls free from disease, since infections gain entrance to the flock through the introduction of new birds from infected flocks, exposure to fowls at poultry shows, or contact with neighboring fowls which are diseased. Infection may also be carried onto the premises on the shoes of persons or feet of animals. Free flying birds are probably responsible for the spread of disease in some cases. Poultry keepers should quarantine newly procured fowls or show birds for a period of from two to four weeks in order to allow time for symptoms of any disease which may be carried to develop.

IMPROVEMENT IN REINDEER HERDS

Dr. L. J. Palmer, in charge of the Government's reindeer experiment station at Nome, Alaska, has just reported that conditions among Alaskan reindeer herds are the best this year in the history of the industry. The fawn crop has been unusually large, and favorable conditions have greatly reduced the ordinary losses. Herd owners report marked gain in size and condition of animals, and a reduction in the losses from those experienced under former methods. Reindeer introduced two years ago on Nunivak Island are doing remarkably well, with the young much larger in size than animals of the same age on the mainland.

A REVIEW OF THE BASIC LESIONS OF DISEASE AND THE IMPORTANCE OF SUCH TO THE GENERAL PRACTITIONER [1]

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IN the general practice of medicine there is somewhat of a tendency on the part of the practitioner to consider only the clinical manifestations of a disease without giving further thought to the basic or structural changes taking place. In other words, the extrinsic physical manifestations are duly considered and appreciated, but the question of just what is taking place histologically is too often ignored. This leads in many instances to erroneous ideas concerning the therapeutic measures indicated. Take, for example, a case of acute parenchymatous nephritis. The urinary and general systemic aberrations are duly noted and cognizance is taken of the meaning of such symptoms. However, that is insufficient. To understand thoroughly a case of nephritis and the rational treatment thereof one must not limit one's conception of the phenomena to the purely physical manifestations, but rather try to form a mental picture of just what is taking place in the affected kidney.

Pathology is the science of disease. To it falls among other tasks the investigations of structural changes accompanying altered function. Ziegler says: "Since the finer organizations of the different tissues vary according to the functions of them and since we are unable to conceive of vital manifestations without a material substratum, so it is also reasonable to believe that pathological manifestations must likewise be the expression of material changes in the tissues concerned."

We have learned in the subject of physiology that vital functions are performed according to laws having a structural foundation. It is therefore evident that vital phenomena differing from those considered normal must rest basically on structural changes of the tissue involved.

The importance of the subject having thus been established, it is the intention to consider briefly some of the more important tissue changes taking place during the progress of a disease.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

The clinical manifestations grouped under the general title of symptoms are, as before stated, basically the result of retrograde changes in the involved tissues. Retrograde changes are characterized in a general way by degeneration and diminution in size, disappearance of the tissue elements, and a simultaneous lowering of the functional capacity of the involved tissue. Any extensive degeneration is accompanied by inflammation, hence to the previously mentioned process of degeneration are added those of inflammation, *i. e.*, exudation and later proliferation. The net result of such a phenomenon is the physical manifestation of the five cardinal signs, *i. e.*, rubor, tumor, calor, dolor and functio læsa. These are the basic signs of disease together with sympathetic systemic relations which may be present depending upon the extent of generalization of the condition.

The cause of retrograde changes are any of the injurious influences to which the tissues are exposed during life. Perhaps the ones of the greatest import to the general practitioner are such as are classified under infections. The etiology, however, is immaterial. The basic lesions are the same, depending only upon the severity of the injurious agent and the duration of its action.

Among the various forms of degeneration are three which are fairly constant, *i. e.*, albuminous degeneration, fatty degeneration and necrosis. Albuminous degeneration is characterized histologically by swelling and enlargement of the cellular elements, due to the formation of granules, the microchemical properties of which indicate that they are albuminous in nature. At the same time nuclear changes take place. Experimental work has made it evident that recovery is possible in albuminous degeneration. On the other hand, if the process is not checked the condition leads to fragmentation of the cell, or fatty degeneration follows and finally necrosis supervenes.

Fatty degeneration may be described as a metamorphosis of the cell in which free intracellular fat is present and indicates a physicochemical change in the cell protoplasm. Virchow believed that this fat was formed by a change of the albuminous content of the cell into fat. Others believe that the fat is brought to the cell in the normal function of general nutrition, but that due to its impaired condition it is unable to assimilate it. The source, however, is immaterial, but the presence of free fat in the cell protoplasm of cells must be regarded as patho-

logical with the exception of certain specialized cells wherein fat is normally present.

Necrosis is the death of individual cells or groups of cells. Occurring directly and rapidly it is known as direct necrosis. When occurring less progressively it is known as indirect necrosis or necrobiosis. Usually necrosis it not demonstrable histologically until after the phenomenon has occurred and sometimes not until some short time has elapsed. Histologically neocrosis finally shows itself by nuclear changes. The nucleus may shrink and stain abnormally and intensely, pyknosis; or it may break into fragments of chromatin, karyorhexis; and finally it may not stain at all but still retain its usual form, finally fading out and dissolving, karyolysis.

Any or all of these retrograde processes may be present during the progress of an acute infectious disease.

It might be of interest to review briefly the basic histological lesions present and demonstrable during the progress of some of the more common acute ailments which we are called upon to treat.

Pneumonia, defined as an acute inflammatory disease of the lungs, shows the typical inflammatory reaction and retrograde processes described above. The extent and severity of these processes depends upon, and is in direct ratio to, the severity of the injury alone. This varies with the different etiological factors. For simplicity's sake this description will be limited to the inflammatory processes following an infection with pneumococci. In the ordinary infection it is not easy to demonstrate any marked injury done to the lung tissue. The inflammatory response seems chiefly to be for the purpose of counteracting the irritation due to the presence of the organisms and their metabolic products. Some injury is done, however, for in such cases it is possible to observe lung cells in the process of karyokinesis for the purpose of replacing destroyed epithelial cells. The most noticeable and in fact the most serious feature in connection with this disease is the mechanical effect of the exudate and the depressing influence of the bacterial products upon other vital organs. The exudate is serofibrinous with a marked emigration of polymorphonuclear leucocytes. There is also as a rule more or less hemorrhage into the air vesicles. In summarizing it may be said, then, that in pneumonia the direct tissue destruction is not so marked as the inflammatory reaction, which by its phys-

ical nature is able to produce serious and distressing symptoms by virtue of interference with the oxygen supply thus caused. The secondary involvement of other organs, for instance the heart, however, is due directly to structural changes in the cells of the tissue involved. This may vary from albuminous degeneration to fatty degeneration and necrosis.

Renal deterioration or nephritis presents a set of basic histological lesions which vary according to the type of inflammation present and the severity of the process. To the primary lesions are added the concurring lesions in other organs and tissues as a result of the renal inefficiency. Histologically there are four forms of renal deterioration. They are tubular nephritis, intracapillary nephritis, vascular nephritis, and capsular glomerular nephritis. Regardless of the etiology or the type of nephritis, the following retrograde processes present themselves, the only difference being that of the particular part of the organ affected. Here, too, as in other parenchyamtous organs, we have the passing picture going through the various forms of degeneration from albuminous, fatty, colloid and amyloid to final necrosis, and the presence in the organ of all or the partly absorbed or excreted tissue débris. Concurrent with the actual primary lesions we have as a result the faulty function of the diseased organ a retention in the body complex of metabolic end products such as the purin bases, creatinin, etc., together with a dissipation of serum albumin and serum globulin in the urinary secretion. The final result, if the condition is not controlled, is a complete aberration in the vital functions of the individual and death.

Primary idiopathic diseases of the heart are usually of such a nature that they belong to the gross anatomical defects, while infectious conditions are rarely primary, and usually secondary. The histological lesions observed may be limited to the lining of the heart, or that part of the lining associated with the valves, or they may be localized in the musculature. Regardless of the location, the actual structural changes partake of a similarity, and in fact the functional aberration also produces the same end results, *i. e.*, cardiac insufficiency.

Diseases of the liver secondary to circulatory disturbances are frequently met with. Primary infectious diseases of this organ are rare, while secondary or metastatic infections or toxemias are more frequent. Histologically, we here also meet with the

various forms of cell degenerations ending either in necrosis or in restoration of the involved cells. Depending upon the severity and form of the injurious agent, various conditions may obtain. Perhaps one of the most common forms or types of hepatic retrograde process is central necrosis of the lobules. This is characterized by destruction of the hepatic cells adjoining the central lobular veins. Depending here, too, upon the severity, the condition may end in restoration of the destroyed cells by active multiplication of the remaining cells, or the lesion may remain and finally by the formation of scar tissue contract and obliterate that lobule. Occasionally a condition is met with in which, by virtue of the action over a long period of time, by a somewhat mild form of irritation, there is a slow progressive destruction of the parenchymatous tissue and a replacement with connective tissue and clinically known as hepatic sclerosis. Finally it might be also said that in certain forms of the previously mentioned central necrosis the retrograde processes are so extensive as to cause the destruction of a considerable part of the organ. Only the blood vessels, bile ducts, sinusoids and connective tissue are left. There is some regeneration of the few hepatic cells remaining and of the connective tissue; however, there is a noticeable diminution in size of the organ, which, due to the infiltration with bile pigments, takes on an intense yellow hue. This is clinically known as acute yellow atrophy.

Both idiopathic and primary infectious diseases of the nervous system are met with in practice. Structural changes in diseases of the nervous system are not different from those seen in retrograde changes of other tissue elements. Thus we observe the various common forms of degeneration and necrosis. A common phenomenon is the displacement of the nucleus to the periphery of the involved neuron, or there may be a disappearance of Nissl's granules, the so-called "tiger spots." Again there may be lesions of the peripheral nervous system manifested by degeneration of the nerve fibers, swelling of the axis cylinder, destruction of the myelin sheath and the presence of myelin, protagon, cholesterin and other lipoids.

Diseases of the gastrointestinal tract characterized clinically by diarrhea and general systemic disturbances show histological changes differing in no major respect from those seen in other diseases—the usual forms of cell degeneration ending in necrosis together with the concurrent inflammatory phenomena, exu-

dation and emigration of protective cells. At the same time there is an increased activity of the mucus-secreting cells, and in fact an increase in the number of these cells, so that it may perhaps be correct to say that one of the forms of degeneration observed in intestinal lesions is of the mucous variety. In consequence of the intestinal infection we frequently have retrograde lesions in other organs. For instance, in typhoid fever there is besides a marked picture of degeneration in the intestinal elements, a more or less severe involvement of the elements of the spleen, heart, bone marrow and skeletal muscles. Changes from mere cloudy swelling down through the various forms such as fatty, colloid or hyalin degeneration to final necrosis are seen. These are due to the toxic effect of endotoxins liberated from the bacteria after autolytic degeneration of them.

Summary

From the foregoing discussion one will gather that disease is a phenomenon characterized by functional incapacity, and aberrant vital manifestations resulting basically from changes in the tissue structure, and due to an injurious agent.

One of the attributes of life with which living protoplasm is endowed is the ability of reacting to a stimulus. When such a stimulus exceeds a certain degree of intensity it becomes an irritant, and the result is tissue damage manifested histologically by structural changes and clinically by alterations in function of the particular part or parts affected. This forms the basic lesion of disease. The outcome as previously mentioned is retrograde processes and inflammation. The latter phenomenon, as we know, is a remonstrative reaction upon the part of the tissue complex against any disturbing factor which tends to harm or destroy the individual tissue elements. Inflammation is too well known a phenomenon to require a detailed description; however, in reviewing basic lesions, it is fitting to consider briefly the particular outstanding features of the condition. Primarily it is characterized by vascular changes in the form of increased blood supply to the affected part, emigration of defensive cells, exudation of fluids containing various biochemical substances, protective and reconstructive in nature, as well as nourishment for the struggling tissue elements. One of the final outcomes must necessarily obtain. Either the individual dies or the protective forces of the body gradually become victorious and the

diseased part is restored to normal, or at least repaired to such an extent that the vital functions may in a measure be resumed. There are two end results in the wake of every healing lesion. The destroyed part is either regenerated by active division of the remaining cells adjoining the lesion if regeneration is possible, or, if it is not, the gap is filled in with connective tissue and a permenant scar remains. Should this occur in one of the vital organs in which regeneration is not possible, the remaining tissue of that particular organ undergoes a compensatory hypertrophy.

It may be well to point out that the various types of basic retrograde processes are not limited to any specific disease, nor do they necessarily appear singly. As a matter of fact they are all more or less constantly in evidence during the progress of a disease. Furthermore, the degenerative processes are not limited to the tissues of the organ or organs primarily affected. Thus in pneumonia we see cloudy swelling, fatty degeneration and necrosis in the heart, liver and kidneys as well as in the lungs, although in this particular disease the primary tissue destruction is not so important as the degenerative changes in other organs.

CONCLUSION

It is of course realized that in this discussion, necessarily brief, all the phases of pathological anatomy, especially the microscopic structural changes, could not be covered in a manner which the subject deserves. However, if after due consideration of the statements made, we leave the realm of pathology and view these changes from the clinician's standpoint, we must, if at all capable of a logical appreciation of the facts obtained by demonstrations of basic histological lesions, clearly see that basic lesions being the starting point of disease, the value of an intimate acquaintance with these microscopical phenomena can not easily be overestimated.

We will further, upon the application of logical thought, clearly see that from a standpoint of specificity, as far as directly aiding the tissues in restoration of their impaired functions is concerned, we are practically helpless. We find that the removal or destruction of the injurious agents and the proper nutritional and hygienic support of the individual is the limit of our usefulness. True, proper and cautious therapeutic measures in the form of medicinal stimulation of lagging organs is helpful;

however, overmeddling may easily cause more harm than good. From the above it will be gathered that about the most useful duty we can perform in aiding a diseased organism is to aid in the control or removal of the etiological factors.

Perhaps the only really efficient agent that we possess which is truly specific in the function of controlling the causes of disease is that class which falls under the general heading of biologicals. However, when all has been said and done, we shall have to admit that in controlling a disease process or aiding the tissues in restoring their structural and functional integrity we are indeed very incompetent aids, and the greatest share of the task falls upon the tissue itself. By far the greatest sphere of usefulness which we may occupy is that of the prevention of disease by the practice of such prophylactic knowledge as we have gained by contact with our five basic sciences, anatomy, physiology, chemistry, pathology and bacteriology.

If the statements herein made may be accorded the distinction of being accepted facts, then we may reasonably assume and believe that if the general practitioner would not limit his thoughts to the vital manifestations physically apparent, and clinically termed symptoms, but go further and delve somewhat into the occult and consider analytically the basic lesions and accept them as the starting point of disease in the same manner that he accepts sclerosis as the end results, his pursuit would be truly laudable. There is no intention whatever of implying that a general practitioner should be an expert pathological technician or theorist, yet the value of sufficient knowledge of the subject to enable him to have at his command a graphic and clear understanding of just what is happening when he is called upon to attend an ailing animal, be it afflicted with an infectious or idiopathic, local or general disease, is clearly obvious. In order to obtain such knowledge practitioners should avail themselves of the innumerable opportunities of conducting autopsies on dead animals. The veterinary profession is usually fortunate in that access to such study is unlimited and, as a rule, without restriction. A clear conception of microscopic pathology together with careful, painstaking autopsies on dead animals will eventually result in a high degree of perfection upon the part of the practitioner, and it is only by the acquisition of this highly technical skill and knowledge that the profession can expect to command the respect of the allied professions, and be able to render the service which this age of efficiency demands.

STUDIES OF COTTONSEED POISONING

I. THE PATHOLOGICAL TISSUE CHANGES RESULTING FROM CONTINUOUS FEEDING OF COTTONSEED MEAL [1]

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COTTONSEED MEAL is one of the most important feeding stuffs used for farm animals, but its usefulness for this purpose is limited by the deleterious effect resulting from including too large a proportion of it in the ration, particularly with certain classes of livestock. Beef cattle when fed six pounds or more per day for three or four months become lame and develop eye trouble, frequently followed by blindness. Pigs are especially susceptible to the trouble caused by cottonseed meal, death frequently resulting in six to eight weeks from a ration containing 25 per cent of this feed. Calves have a susceptibility similar to that of pigs.

Although this so-called "cottonseed meal injury" has long been recognized as a very definite factor, the specific quality or property of the meal responsible for the trouble is not yet entirely clear. The injury has been attributed to cholin or betain or their decomposition products, to obstruction of the intestines by fibers, to decomposition products formed by micro-organisms, to dietary deficiencies, to gossypol, the phenol-like compound first isolated by Marchlewski (1),[2] and to other factors. That cottonseed meal injury is due to the toxicity of gossypol rests on the work of Withers and Carruth (2). Their explanation of the trouble seems to be the one most widely accepted at the present time. However, there is still much uncertainty as to whether gossypol is entirely responsible, and the question as to how the injury may be prevented or relieved other than by giving up the use of the meal where injury i sa possibility, particularly requires further study.

The pathology of cottonseed meal injury has been studied

[1] Presented before the Society for Experimental Biology and Medicine, Ithaca, N. Y., May 19, 1922.

[2] Figures in parentheses following authors' names refer to list of literature at end of paper.

by numerous investigators and the literature has been well summarized by Wells and Ewing (3). Such a wide variety of symptoms and of postmortem findings have been reported as to leave one in doubt as to what are the significant pathological results of cottonseed feeding, or else to force one to conclude that a variety of causes are concerned rather than a specific toxic agent. The specific pathology involved must be of primary importance in studying the prevention or relief of cottonseed meal injury.

As experiment inaugurated by Harper and Haines, of the Department of Animal Husbandry, with the object of studying cottonseed meal injury from a nutritional standpoint furnished the opportunity for the studies here reported. A group of twelve pigs, previously inoculated against cholera, weighing from 30 to 50 pounds each, were fed on the following ration: 60 per cent corn meal, 10 per cent wheat middlings, 25 per cent cottonseed meal, 5 per cent molasses. Mineral mixture, ad libitum.

The pigs were fed on board floors and had no access to soil or green material. The gain in weight was nearly normal until about a week before death, when symptoms appeared. Nine of the pigs died during the period from the eighth to the twelfth week from the beginning of the trial. The usual symptoms observed previous to death were failure to eat, vomiting, rapid, short, shallow breathing, anemia, and a weakness of the leg muscles. Frequently a pig would show these symptoms and recover sufficiently to eat more food, whereupon the severity of the symptoms would return and death usually result. At the end of the fourteen weeks' feeding, the percentage of cottonseed meal in the ration was decreased for the three surviving pigs and mangels were added to their diet. One of these pigs was slaughtered four weeks later and the remaining two five weeks after the change of diet. These passed inspection as suitable for food.

Pig No. 1 died 55 days after the experiment was begun. Autopsy showed pale mucous membranes and a reddening of the skin along the right side of the abdomen and the neck. The condition of the animal was rather poor, with anemic, flabby musculature and edema of the intermuscular connective tissues over the sternum. The peritoneal cavity contained about 500 c.c. of a brownish yellow liquid and a little fibrin over the visceral peritoneum. The ascitic liquid gelatinized on standing. The serous surface of the small intestines was markedly congested. Most of the lymph nodes of the body were swollen and congested.

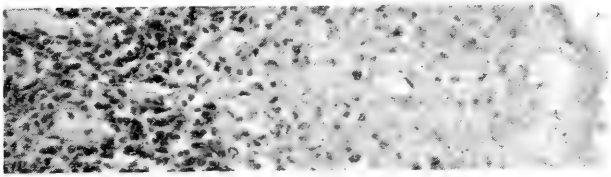
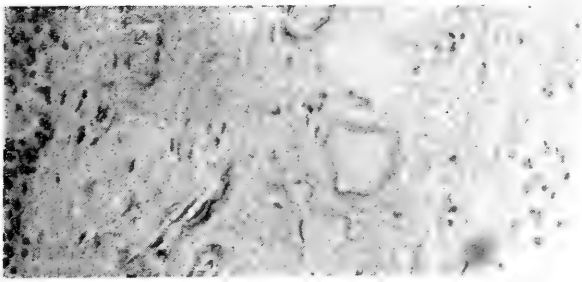


Fig. 1



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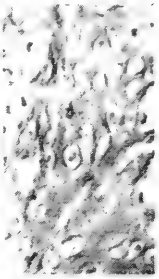

Fig. 3

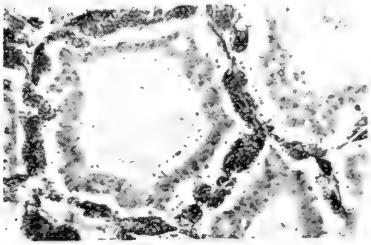

Fig. 4

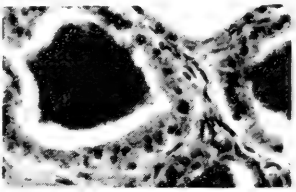

Fig. 5

Fig. 6

The gastrohepatic, bronchial and mediastinal lymph nodes were hemorrhagic.

The capsule of the spleen contained numerous petechiæ. On section a little blood oozed out; the corpuscles were swollen and congested.

The kidneys showed acute parenchymatous nephritis. The mucosa of the pelvis of each kidney was congested. The adrenals were apparently normal. The urinary bladder contained a little urine. The mucosa showed marked congestion throughout. The broad ligament was congested, otherwise the genital organs appeared normal.

The liver was swollen and the lobules apparent. On section some of the lobules were reddened, others were translucent with a clear liquid oozing out. The large veins were distended.

The stomach contained partly digested corn meal and straw. The surface of the mucosa was a peculiar yellow color, otherwise apparently normal. The small intestines contained a little bile-stained mucus, the mucosa being slightly congested. The large intestines contained dry, dark greenish material; the mucosa was slightly congested.

The thoracic cavity contained about 300 c.c. of liquid and a slight amount of coagulum. The lungs showed marked subpleural and interlobular edema affecting practically the entire lung tissue. The left cardiac, apical and part of the diaphragmatic lobes were solidified. On section the lobules were solidified and the interlobular tissue was edematous, giving the lung a mottled appearance. The rest of the lung showed individual solidified lobules and vesicular emphysema. The right lung showed changes similar to the left. On opening the bronchi a considerable amount of liquid escaped.

The myocardium was paler than normal; the coronaries were congested. The pericardial sac contained an increased amount of liquid.

DESCRIPTION OF PLATE

Fig. 1. Healing of hemorrhage. Sinus of lymph node, pig 11. ×285.
Fig. 2. Organization of subpleural edema, pig 11. ×285.
Fig. 3. Organizinz peritoneal coagulum, pig 12. ×285.
Fig. 4. Thyroid, pig 2, showing marked perifollicular hyperemia and granular material in the follicles. ×140.
Fig. 5. Normal thyroid after change of diet, pig 11. ×285.
Fig. 6. Lymphoid nodules surrounding a small bronchus, pig. 11. ×80.

The thyroid glands were swollen and congested. The larynx and pharynx were congested and contained a little of a sort of oily liquid. The bones and joints were apparently normal. The cerebral meninges were congested and edematous.

Histological examination of the lung showed interlobular and subpleural edema with a considerable amount of fibrin and a few scattered erythrocytes. The lung tissues showed hyperemia, a few scattered polymorphonuclear leucocytes and marked desquamation of the lining of the air sacs. The small bronchi contained some granular material and red corpuscles, a few lymphocytes and desquamated alveolar epithelium.

The lymph nodes showed hemorrhage in the sinuses and in the lymphoid tissue. The lymph nodules were indistinct. There was also edema and hyperemia of the lymph nodes.

The thyroids showed marked hyperemia and edema between the follicles, with a granular material in the follicles in place of the colloid substance (Fig. 4).

The myocardium showed hyperemia of the sinusoids and cloudy swelling of the muscle fibers.

The pia-arachnoid showed edema and hyperemia. In the motor cells the Nissl's granules were absent and there was some vacuolation of the cytoplasm. There was marked hyperemia of the cerebral cortex.

The liver showed marked passive hyperemia with vacuolation and cloudy swelling of the liver cells, mostly near the center of the lobules.

The kidneys showed active hyperemia and slight cloudy swelling of the convoluted tubules.

The intestinal mucosa showed slight hyperemia and some proliferation of the glandular cells.

Pig No. 2 died on the fifty-seventh day, pigs 3 and 4, on the sixty-fifth day. Three more died on the seventy-seventh day. Pig 8 died on the eighty-fifth and pig 9 died on the ninety-third day of the experiment.

The lesions were almost identical in all of the animals, with the following exceptions: Pig 8 showed solidification in the lung that appears to be of longer duration, and the presence of numerous *Strongylus paradoxus* in the smaller bronchi. Pig 9 showed pale and more firm solidification of the cardiac lobes of the lungs and marked dilatation of both ventricles of the heart.

Pigs 10, 11 and 12 had recovered after change of ration and

were fattened. Pig 10 was slaughtered four weeks after changing the diet and passed for food. Pigs 11 and 12 were similarly slaghtered for food five weeks after change of diet. They showed healed lesions in the lungs. In pig 12 there was clear liquid in the peritoneal cavity and a little coagulum. Microscopically, in this coagulum there were large numbers of endothelial cells and fibroblasts (Fig. 3). In the subpleural tissue there was evidence of previous edema with young blood vessels, fibroblasts and loose fibrous tissue (Fig. 2). A hemorrhagic lymph node showed similar evidence of healing (Fig. 1). The thyroid glands appeared normal (Fig. 5). There were numerous lymphoid nodules around the large and small bronchi (Fig. 6).

Haines attempted an experiment upon pigs with a ration containing 2 per cent of cottonseed previously treated with $CaCl_2$, which is supposed to oxydize the gossypol. He used 45 pigs divided into pens of five. The results were the same for those fed the treated as the untreated cottonseed meal. The deaths were about the same as in this experiment. The pathological tissue changes recorded were hydrothorax, edema of the lungs, congestion of the intestines, and some showed congestion of the lymph nodes. All showed foamy liquid escaping from the nostrils.

Frost and Varley attempted to produce mastitis by feeding a heavy protein diet. For this purpose a Holstein cow was fed cottonseed meal for six months, beginning with 6 quarts and gradually increasing to 10 quarts daily comprising the entire grain ration, with hay for roughage. At the end of that period she failed to show any ill effects. Two adults, a boy 5 years old and two dogs, fed milk of this cow the first week of the experiment, developed diarrhea. Two dogs fed the milk the second week did not show any ill effects.

A two-day-old calf began sucking this cow 15 days after the experiment was started. He gained weight steadily and showed no apparent ill effects. The calf was killed by bleeding from the carotid at the age of 5 weeks. Autopsy showed edema of the perirenal fat and of the omentum. In the peritoneal cavity there was about 600 c.c. of a deep amber colored liquid that gelatinized on standing, similarly to the ascitic liquid found in the pigs. All the other organs appeared normal. The meat was used for food without any ill effect.

Another calf sucked this cow for 3 weeks and 6 days and then

was slaughtered. The peritoneal cavity contained about 900 c.c. of amber colored liquid that gelatinized on standing. The omentum showed marked edema similar to the first one. The thyroids and lungs were normal.

Discussion

The lesions constantly found in these pigs were ascites, edema of the perirenal fat, hydrothorax, hydropericardium, interlobular and subpleural pulmonary edema, anasarca, hyperemia and hemorrhage in the lymph nodes, hyperemia and marked diminution of colloid in the thyroid glands, and distention of the sheath of the males. That the animals die of pulmonary edema, or, as it is commonly expressed, "drown in their own serum," as a result of cottonseed poisoning has been known, but that the edema is general has not been previously demonstrated. Judging from the lesions in the calves, it seems quite possible that the ascites appears before the pulmonary edema. It is also interesting to note that the poisonous substance has apparently been transmitted through the milk of the dam. This may be of importance in regions where cottonseed plays an important part in feeding milch cows supplying milk to infants.

The ascitic liquid was of a brownish yellow color and of an oily appearance but not of an oily consistency. It gelatinized three minutes after removal, forming a peculiar opalescent streaky solidified mass surrounded by brownish yellow serum. This liquid in the calves was similar to the ascitic liquid in the pigs that died. The ascitic liquid in the pigs that recovered after change of diet was of the consistency as well as appearance of water. The slight amount of coagulum on the peritoneum contained numerous fibroblasts. This seems to show that the ascites is possibly the first to appear and the last to disappear in cottonseed meal poisoning.

The periods at which the pigs died suggests that some of them are more tolerant to the cottonseed than others. The difference in the appearance of the thyroid glands in those animals that died and those that recovered is suggestive. We hope to attempt certain experiments with a view of determining if possible the cause of the relative immunity.

The actual cause of the edema is as yet a mystery. It is possible that the effect of the poisonous material upon the myocardium is responsible for it. This seems to be strengthened by the fact that the last pig to die showed cardiac dilatation.

Some authors also state that "hypertrophy of the heart" is the lesion in cottonseed poisoning. This hypertrophy was probably a result of the obstruction to the circulation in the lungs. The condition of the thyroid glands may be the result of edema. The contention of some biochemists is that edema is due to increased acidity of the tissues. On account of this, Wells and Ewing (3) attempted to determine whether or not there is acidosis in cottonseed injury. Their results were negative.

We hope to perform some experiments with a view of solving some of the biochemic problems that suggest themselves as a result of the lesions we have encountered in these experiments. Thus far the following conclusions seem to be justifiable:

1. That the lesions in cottonseed injury are generalized edema.
2. That the initial lesion, apparently, is ascites.
3. That the poisonous substance may be transmitted through the milk.

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DOCTOR DORSET GOES ABROAD

Dr. M. Dorset, Chief of the Biochemic Division of the Bureau of Animal Industry, sailed November 18 for France and England, where he will obtain information concerning the most recent foreign investigations on the prevention of anthrax, foot-and-mouth disease, hog cholera, and other important animal diseases.

While abroad Doctor Dorset will represent the United States in an unofficial and consultative capacity at the meeting of the advisory committee on anthrax set up by the International Labor Office. The work of that committee will be to consider solely scientific and technical questions relating to the prevention of anthrax among workmen employed in wool, hair, and leather factories, and at the same time the control of anthrax in herds and flocks.

PROGRESSIVE PNEUMONIA IN SHEEP [1]

By HADLEIGH MARSH,
Montana Livestock Sanitary Board, Helena, Mont.

MANY SHEEPMEN in Montana recognize that every year they sustain a considerable loss due to the development in a certain percentage of their sheep of a condition the symptoms of which cause the affected animals to be designated as "lungers," "heavers" or "blowers." The mortality is considered to be 100 per cent, and in affected bands the annual loss averages from 2 to 10 per cent. This condition has been found by the Montana Livestock Sanitary Board to be a chronic progressive pneumonia, the cause of which has not as yet been definitely determined. At the request of several of the sheepmen of the State an investigation of this condition has been carried on, with the result that the history, occurrence, symptoms and pathology have been quite thoroughly worked out. The work on the etiology has not been completed, and therefore we have not been able to inaugurate any control measures.

The existence of this condition in sheep was first brought to the attention of the Livestock Sanitary Board in 1915, when two sheep outfits south of Fort Benton reported about 10 per cent annual loss. Field investigations were made, and early in 1916 two affected sheep were shipped to the Bureau of Animal Industry at Washington for investigation. The bureau was unable to determine the cause of the condition from these two cases, but reported that a similar pneumonia had been observed in Michigan, where the hemorrhagic septicemia bacillus had been found to be the causative organism.

During 1916 and 1917 further field investigations were made, and this condition was found to exist in a number of sheep bands in the central part of the State. In 1917 two affected sheep were sent to Dr. Kinsley, at Kansas City, for investigation, and in 1919 two sheep were shipped to the Rockefeller Institute, where Dr. Theobald Smith studied the condition. In 1919 the Livestock Sanitary Board opened its pathological laboratory at Helena, and since then pathological and bacteriological studies have been made of a number of cases of this pneumonia, and a large number

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

of field cases have been observed. At the present time experiments are being carried on in cooperation with Montana Agricultural Experiment Station in an attempt to determine the etiology of the disease.

The history of this disease in Montana leads us to the conclusion that it is a specific entity, and should be described as such. We find no mention in the available literature of such a condition in sheep, and the peculiar pathological condition found in the lungs of these sheep does not appear to have been described as occurring in any animal.

DISTRIBUTION

As to the distribution of this progressive pneumonia in sheep in Montana, it has been reported authentically from nine counties covering the middle third of the State, just east of the Continental Divide. Only one infected band has been brought to our attention on the western slope, and it was found that these sheep had been brought from east of the Divide. We do not know of the existence of this condition in the eastern third of the State, but it may occur in all parts of the State, as no survey has been made to determine definitely its extent. We have been informed that this type of pneumonia in sheep is not unknown in Utah and Wyoming, although it apparently is not mentioned in any published report.

There are many sheep outfits in the affected portion of the State that are considered free from this trouble. Others who are losing sheep at the present time say that they had no such trouble in past years. Such owners usually think that their losses began when they bought their sheep from some other section where the disease was known to exist.

From the information which we have been able to obtain from various sheep owners, it appears that this disease attacks sheep of all classes and ages, with the greatest losses among ewes over 4 years old. There is a general impression among the sheepmen that the losses from this source are confined to old ewes, but in one band, where the same ewes were kept from the time they were 2 years old until they were 7, losses occurred in about equal numbers every year.

ETIOLOGY

The cause of this pneumonia has not been determined. We are of the opinion that the disease is infectious, and two organ-

isms have been isolated quite constantly from our cases, one of which we think may prove to be the primary causative factor. As the organism primarily involved in any disease is only one factor in the etiology, we must also look for the predisposing conditions which make the individual animal susceptible to the infection. In this case these factors are also undetermined as yet. While the condition is seen most often in old ewes, there is not evidence that age is a determining factor. Poor general condition and insufficient feed do not seem to be of primary importance as predisposing factors, as considerable losses occur in small bands on the best of feed. It was thought by the sheepmen who first reported the condition to this office in 1915 that the feeding of alfalfa hay was responsible for the trouble. They said that the disease had been unknown in previous years when the sheep wintered on range and wild hay. Whether the present methods of feeding have anything to do with the occurrence of the pneumonia we do not know.

SYMPTOMS

The symptoms of progressive pneumonia of sheep develop very gradually, and it is probable that the pathological condition in the lungs begins to develop some time before clinical symptoms appear. It is first noticed that when the band is being driven these sheep lag behind and breathe heavily, especially when moving up a slope. A little later the altered respiration can be noticed when the animal is standing. The nostrils are constantly dilated and there is noticeably increased flank breathing, with acceleration of respiration. In the later stages the respiration becomes very rapid and labored, and there is mouth breathing. In most cases there is little, if any, discharge from the nostrils, and very little cough. In some cases the condition seems to be more acute, and there is a large amount of mucous exudate, causing violent coughing. As the disease progresses the animal gradually becomes emaciated, although the appetite remains good. Death finally occurs as a result of asphyxia. Temperatures have been taken on several cases, and there seems to be a slight increase in temperature, but no marked fever.

PATHOLOGY

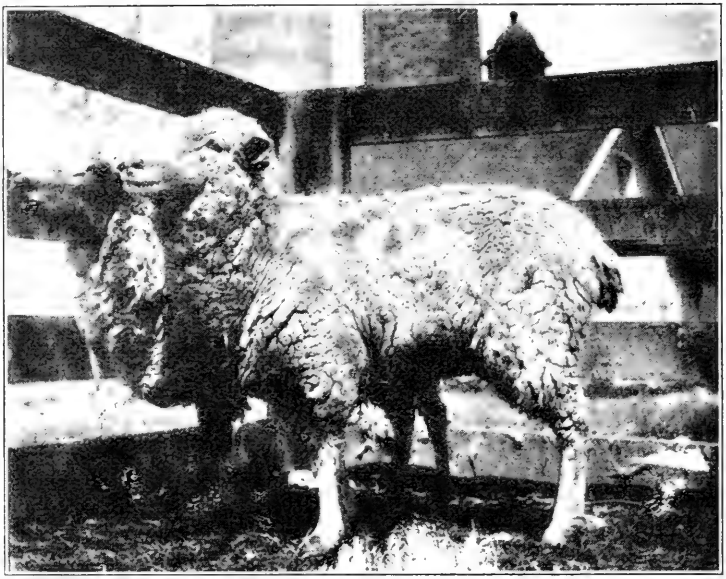
Up to this time I have made postmortem examinations on 17 cases of this disease, and in addition 5 sets of lungs have been sent to the laboratory. Our findings in these 22 cases agree with

reports on a number of autopsies made by other veterinarians in the State. The autopsies on which this description is based were made on cases which were killed artificially at different stages of the disease, except for one case in which death was due to the disease.

Descriptions of six cases have been selected as representing the different pathological conditions found in this disease. The lesions are very characteristic, and there is great similarity in general throughout the cases, but the pathological picture varies somewhat as the cases are more or less acute. The first description is that of a sheep in the last stages of the disease, detroyed and autopsied in the field, and included here because it is believed that it is typical of the majority of cases recognized in the field. The others are from records on sheep which were brought to the laboratory for observation, all of which show some points of divergence from what we consider the average case.

No. 230. A 4-year-old ewe in an advanced stage of the disease. She was greatly emaciated, and the respirations were very rapid, with very pronounced flank breathing. She was killed and a postmortem examination made immediately. The only abnormal condition, aside from emaciation, which could be found outside the thoracic cavity was the presence of a large amount of peritoneal fluid. On opening the chest wall the lungs did not collapse, but filled the entire thoracic cavity. The dorsal border was very full and round. The lungs were heavy, and felt solid on palpation. There were no nodules nor abscesses. The color was very pale, like a pale flesh color. The cut surface showed a partial consolidation throughout, with a small amount of air in part of the alveoli. The color of the cut surface was pale, with a gray effect. There were some hemorrhagic areas. The mediastinal lymph glands were enlarged and friable, and had a moist, fatty appearance. The cortex of the glands was very light colored.

Miscroscopic sections of the lung show the general picture of a chronic interstitial pneumonia. There is infiltration of small mononuclear cells into the wells of the bronchioles and alveoli and a nodular accumulation of small mononuclear cells at various points, chiefly in connection with the walls of bronchioles. There is proliferation of connective tissue in irregular strands between the alveoli. There is hemorrhage into the alveoli in some parts of the section, and a small amount of cellular and serous exudate in many alveoli. The lumen of many of the alveoli is obliterated by thickening of the walls due to cellular infiltration. There is perivascular infiltration along the course of the veins and around small vessels in connection with the walls of some of the bronchioles, giving the nodular appearance. Some of the small arteries are engorged. There is cellular and mucous exudate and hemorrhage into the lumina of some of the bronchioles.



Fif. 1.—Sheep Nos. 281 and 301. The heads are held high and the nostrils dilated

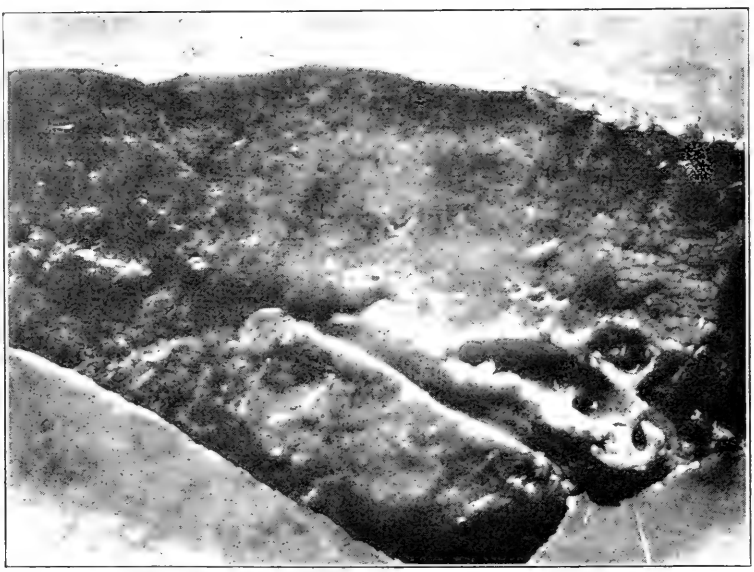


Fig. 2.—Longitudinal section of lung of Sheep 281. Shows indistinctly the coarsely granular appearance due to the solid gray lobules standing out from the cut surface.

The cellular infiltration throughout the section consists principally of small mononuclear cells, with a few polymorphonuclear leucocytes. Where there is exudate in the alveoli it consists of epithelial cells, lymphocytes and a few polymorphonuclear leucocytes and red blood cells. In some of the bronchioles there is a cellular exudate consisting of red blood cells and polymorphonuclear leucocytes.

No. 281.—This was a 4-year-old ewe received at the laboratory May 14, 1921, as a "lunger." She was in fair condition at that time, but the respiration, even when the sheep was at rest, was faster than normal, and somewhat labored. From May 16 to May 31 a record of temperature and respiration was kept. This showed a slight rise in temperature during this period, the maximum being 105. The respiration at rest increased from 120 on May 16 to 170 on May 28. On May 28, a blood count was made which showed 10,400,000 red cells and 11,400 leucocytes. The differential count showed lymphocytes 75 per cent, polymorphonuclears 23 per cent, large mononuclears 1 per cent, and eosinophiles 1 per cent. This indicates a relative increase in the lymphocytes.

This sheep was killed May 31. The postmortem examination showed no lesions outside of the thoracic cavity. The lungs lid not collapse when the chest wall was opened, but filled the whole thoracic cavity. There were extensive adhesions between the pleura and the diaphragm and thoracic wall. There were small adhesions along the dorsal border of the right lung and on the apical lobe of the right lung. The lungs had a pale, glistening, opaque appearance. The color was gray in some portions and a dull pale red in others, in contrast to the normal pink color. On section it was seen that the apical lobes and the central portions of the cardiac and diaphragmatic lobes of both lungs were consolidated. The outer portion of these lobes was partially air-containing, this portion forming a zone about 2 cm. deep. In the consolidated portion each lobule was sharply defined, appearing on the cut surface as a slightly projecting gray area about 3 mm. in diameter. This gives a coarsely granular appearance to the cut surface. At one place where the condition was apparently farthest advanced a group of lobules appeared almost white and stood out from the cut surface. In the apical lobe of the left lung there was a considerable amount of mucopurulent material in the bronchi. The mediastinal glands were large and fatty in appearance. On section they were soft and pale, the cortex being nearly white.

The microscopic sections showed a picture similar to that described for No. 230. Sections through the pleura show it to be greatly thickened. The smaller bronchi contain a cellular exudate consisting chiefly of polymorphonuclear leucocytes. In places there are, in relation with the bronchi, tubercle-like accumulations of cells consisting principally of small mononuclear cells. The lumina of the alveoli throughout this section are obliterated by an infiltration into their walls of small mononuclear cells. The capillaries are engorged with blood.

No. 290.—This was a 5-year-old ewe received June 1, 1921. At that time she was in fair condition but showed the rapid, labored

Fig. 3.—Section of lung of Sheep 186. Shows the infiltration of the alveolar walls, and the peribronchial and perivascular infiltration, with two tubercle-like accumulations of small mononuclear cells. X 15.

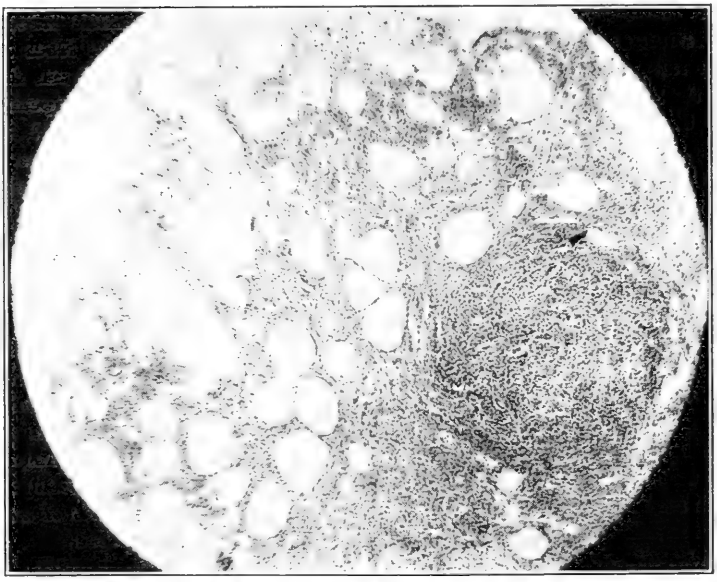


Fig. 4.—Portion of section shown in Fig. 3. X 65.

respiration of a "lunger." She died June 16, presumably as a result of the pneumonia. The temperature record showed a slight increase above normal.

On postmortem examination the principal lesions were found in the respiratory tract. The larynx and trachea were normal. The general appearance of the lungs was rather different from that usually found in a "lunger," in that the condition appeared to be more acute than usual. The color was more red than gray. The lungs did not collapse to any extent when the thoracic cavity was opened, but a large part of the diaphragmatic lobes was air-containing. This would indicate that in this case death was not due to asphyxia. The apical and cardiac lobes of both lungs were entirely consolidated. The color was mottled red and gray, the general appearance being of a dull red. The individual lobules stood out as gray areas about 3 mm. in diameter. The apical lobe of the right lung was much enlarged and lobulated. A large part of the diaphragmatic lobes was air-containing, but not normal, as it did not have the bright pink color of normal lung and did not collapse to any extent. This portion of the lung was still elastic. Along the basal borders of the diaphragmatic lobes there was partial consolidation similar to that in the apical lobes. At the posterior border of both lungs there was some involvement of the pleura, with a white, fibrous appearance and contraction of the lung tissue. There were no adhesions. The parietal pleura was normal.

The mediastinal glands were somewhat enlarged and appeared moist. They contained gas bubbles and were friable. The color was white on the surface, contrasting with the dark medullary portion. The body lymph glands were congested. The left precrural lymph gland was enlarged to a diameter of about 8 cm. and was very hard. On section it was found to consist of several old foci containing a dry, white, caseous material formed in concentric layers.

Microscopic sections from the air-containing portion of the lung show a slight infiltration of small mononuclear cells into the walls of the alveoli. There are several small tubercle-like accumulations of small mononuclear cells in relation with the arteries and bronchioles. There is an occasional isolated giant cell. Sections from the consolidater portion of the lung presents a different picture from that found in sections of the majority of lungs examined. There is a slight thickening of the alveolar walls due to an infiltration with small mononuclear cells and also an exudate into the alveloli, consisting of small mononuclear cells and epithelial cells. The capillaries of the alveolar walls are injected. In places the alveoli contain solid plugs of cells, constisting mainly of polymorphonuclear leucocytes and small mononuclear cells. These plugs coalesce in places, forming dense accumulations of leucocytes covering an area of a number of alveoli. The centers of these foci show degeneration and necrosis. There are a number of giant cells in the alveolar plugs. The bronchioles contain a cellular exudate similar to that in the alveoli.

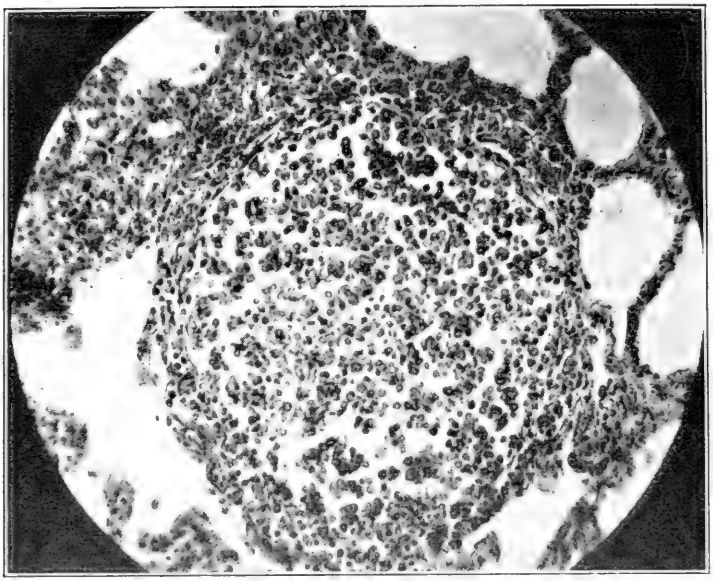


Fig. 5.—One of the tubercle-like areas. X 200.

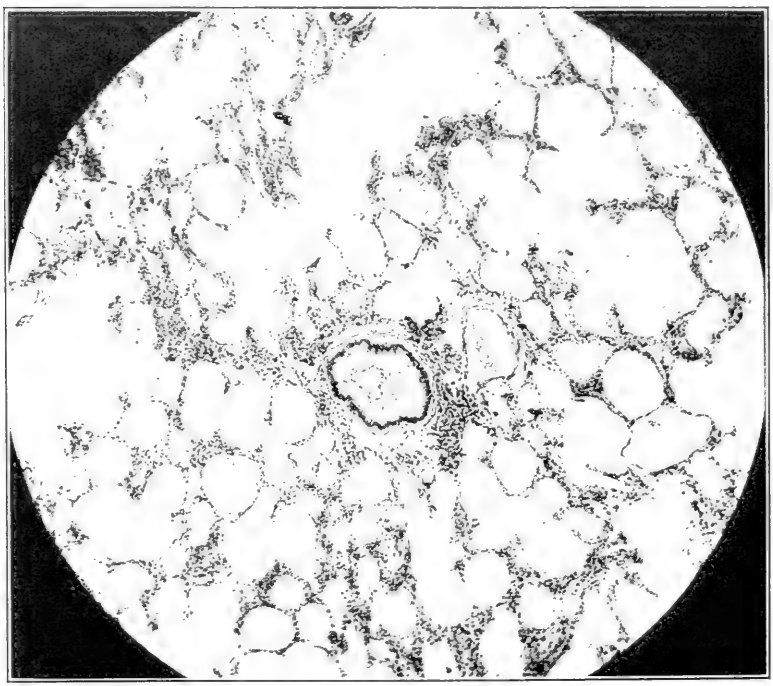


Fig. 6.—Section of slightly affected portion of lung of Sheep 290. Peribronchial and interstitial infiltration. X 70.

No. 301.—This case was a 5-year-old ewe received at the laboratory May 14, 1921. At that time she was in poor condition and the wool was taggy, but she showed only very slight symptoms of progressive pneumonia. The respiration was apparently slightly labored after exercise. Record of temperature and respiration was kept from May 16 to July 13. The temperature ran most of the time between 103 and 104, going up over 105 a few times on hot days. The respiration increased to about 100 by June 1, and from then on varied between 100 and 150. The temperature record was discontinued after July 13, and the case was now definitely considered to be one of progressive pneumonia. The progress of the condition was unusually slow in this case.

On August 2, eleven weeks after the sheep was received, although the disease had not yet approached the fatal stage, the animal was destroyed and postmortem examination made immediately. No lesions were found outside the thoracic cavity. The lungs showed a pneumonia similar to that described in the other cases. The entire lungs were involved, with patchy consolidation. The color of the consolidated patches was gray, and the partially air-containing portion was pale pink. The consolidated portions show the same coarsely granular appearance noted in the other cases. There was in this case a condition which has not been noticed in other "lunger" specimens. This was the presence of numerous small points of calcification, which appeared in some places like casts of the bronchioles. The pleura was normal. The mediastinal glands were enlarged and had a moist, fatty appearance. They were light colored, and there were some small bubbles beneath the capsule.

Microscopic sections showed peribronchial infiltration with small mononuclear cells, and infiltration of small mononuclear cells into the walls of the alveoli. There was exudate into the alveoli in some places, consisting of epithelial cells, polymorphonuclear leucocytes and small mononuclear cells. The capillaries in the alveolar walls were engorged with blood, and there was proliferation of connective tissue in the alveolar walls.

No. 310.—This case, in contrast with the last one described, developed rapidly. It was a 4-year-old wether, received at the laboratory August 10, 1921. At that time he showed no very marked respiratory disturbance. During the next ten days respiratory symptoms developed quite noticeably, and periods of severe coughing occurred, with a discharge of mucous exudate. On August 20 the sheep was destroyed, just after a violent coughing spell, and postmortem examination was made immediately. The lower portion of the trachea was found filled with a mucous exudate, which extended into the bronchi. The apical and cardiac lobes of the lungs were almost completely consolidated. The anterior and ventral portions of the diaphragmatic lobes were completely consolidated. The posterior and dorsal portions of the diaphragmatic lobes were air-containing, with some patches of consolidation. The consolidated portions were gray, in contrast with the dull pink of the air-containing portion. The individ-

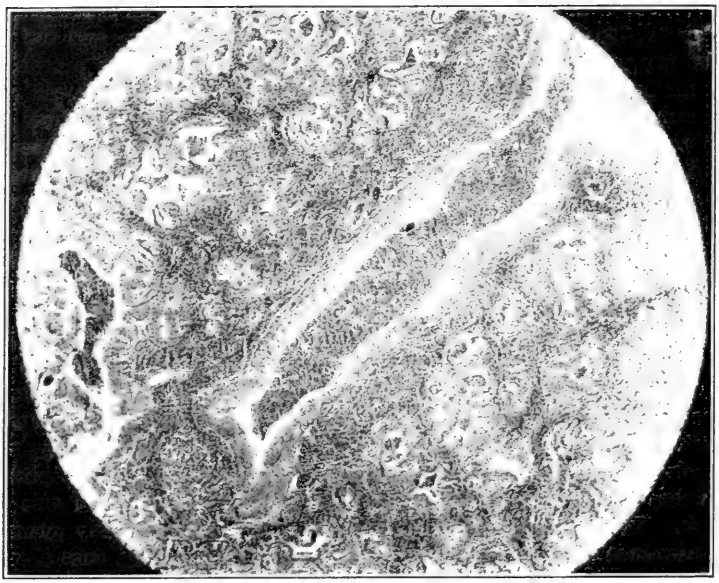


Fig. 7.—Consolidated areas in lung of Sheep 290. Peribronchial infiltration. Exudate into bronchi and alveoli. X 45.

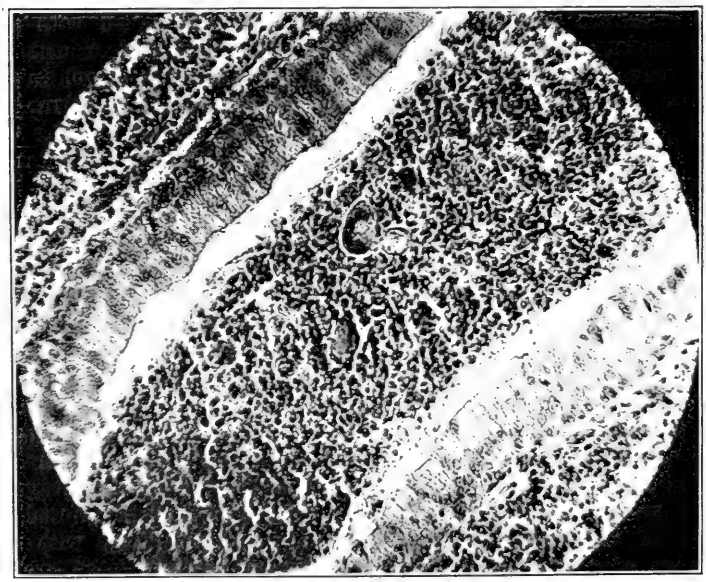


Fig. 8.—Higher magnification of bronchus shown in Fig. 7. Giant cells in exudate of polymorphonuclear leucocytes. X 200.

ual lobules of the consolidated lung were sharply defined, giving a coarsely granular appearance. The mediastinal glands were enlarged and light colored.

Microscopic section of the consolidated portions of the lung showed the appearance of a mass of bronchioles. This was evidently due to a change in the epithelium of the alveoli in this area, in which the epithelial cells have reverted to a cuboidal type. The walls of the bronchioles showed a dense infiltration with small mononuclear cells.

There was an exudate into the alveoli and bronchi, consisting mainly of polymorphonuclear leucocytes, with some small mononuclear cells and epithelial cells. In this exudate there frequently occur giant cells, and some masses of cytoplasm which show no nuclei. There was congestion of capillaries throughout the section, and some hemorrhage. There were a number of nodular accumulations of small mononuclear cells. Throughout the section there was infiltration of small mononuclear cells and a few polymorphonuclear leucocytes. The mucosa of the bronchi and bronchioles showed evidence of the secretion of a large amount of mucus. There is proliferation of connective tissue in the alveolar walls and beneath the pleura.

Sections of the air-containing portion of the lung showed extensive infiltration of the alveolar walls, which were greatly thickened, and in many places obliterated in the lumen of the alveolus. There were dense accumulations of small mononuclear cells in places, just outside the walls of the small bronchi.

No. 339.—This case was that of a sheep killed in a comparatively early stage of the disease. It was a 4-year-old ewe, received at the laboratory October 4, 1921. She was in fair condition but showed evidence of respiratory trouble. Flank breathing was more pronounced than in a normal animal and the nostrils were constantly dilated. On October 24 this animal was destroyed. She had changed very little as far as external appearance and symptoms are concerned.

On postmortem examination no lesions of any kind were found outside the thoracic cavity. When the thorax was opened the lungs were found partially collapsed and did not fill the entire cavity as they do in the far advanced cases. The general color effect was of a dull pink, rather than the gray appearance found in the advanced cases. There was partial consolidation of the lungs, particularly along the basal borders. The dorsal and posterior portions of the diaphragmatic lobes were air-containing and elastic, but were not normal. The color was dull and the consistency more firm than in a normal lung. The consolidation was complete over a considerable area along the basal borders, and the appearance here was like that in the consolidated portions in the more advanced cases. In this region the lobules were distinctly marked, each one appearing as a solid gray plug. Dorsal to this region, and in the anterior part of the diaphragmatic lobes, there were areas showing on the surface an interstitial thickening, the lobular walls appearing as gray lines. In another area the appearance on the surface was of numerous small white nodules projecting slightly. The apical and cardiac lobes did

not show any complete consolidation, but contained patches of partial consolidation. On section, part of the bronchi showed slight thickening of the walls. There was no pus in the bronchi, and no pus could be forced from the consolidated lobules. A careful examination for lungworms revealed none.

Microscopic examination of sections through a completely consolidated portion of the lung showed the characteristic histopathology as described for case No. 230. Sections made through that portion of the lung described above as showing the surface appearance of interstitial thickening, with the lobular walls appearing as gray lines, show air-containing alveoli, with patches of consolidation, and a number of tubercle-like accumulations of small mononuclear cells.

In the air-containing portion there is cellular infiltration into the alveolar walls. At one side of the section there is a large bronchus showing a great deal of mucus production in the ciliated epithelium. The capillaries in the alveolar walls are injected. Sections made through the elastic air-containing portion of the lung show all the alveoli open. In a few of them there is an exudate of epithelial cells. The capillaries of the alveolar walls are injected and there is hemorrhage into the walls. There is some infiltration of small mononuclear cells into the alveolar walls, and an increase of connective tissue fibers. There is peribronchial and perivascular infiltration with small mononuclear cells.

No. 421.—A brief description of this case is introduced because it was a case of a young ewe. This was a 2-year-old ewe which was brought to the laboratory about January 1, 1922. At that time she was in rather poor flesh and showed a somewhat accelerated rate of respiration. She was held at the laboratory until February 24, during which time she showed little change. On February 24 the ewe was destroyed and postmortem examination made immediately. The entire lungs were dull in color, but showed no areas of complete consolidation. They were elastic and air-containing throughout. The mediastinal glands showed the characteristic enlargement and fatty appearance. Sections of the lung showed the characteristic interstitial infiltration with small mononuclear cells, congestion of capillaries and hemorrhage, and tubercle-like accumulations of small mononuclear cells outside the bronchial walls.

GROSS PATHOLOGY

From the postmortem findings in the six representative cases described it will be seen that the lesions are confined to the thoracic cavity, except for slight changes in the lymph glands of other regions, and in some cases an excess of fluid in the peritoneal cavity.

The gross appearance of the lungs in an advanced case of this disease is very characteristic. When the thoracic cavity is opened the lungs do not collapse, but appear as if cast in the

mold of the chest cavity, the dorsal borders appearing very full and round. Even in those cases where a large part of the diaphragmatic lobes is air-containing, there is more rigidity than normal, due to the thickening of the walls of the alveoli. In the majority of cases there is no extensive pleuritis, although in some cases there is a more or less extensive pleuritis with adhesions. As seen before sectioning, the lungs have a pale, glistening, opaque appearance in the consolidated portions, and the color throughout is a pale flesh color, with a gray effect, in contrast to the bright pink of a normal lung.

On section it is found that a large portion of the lungs is completely or partially consolidated, particularly in the central portion, following the larger bronchi, and more in the ventral than in the dorsal portion. In nearly all the advanced cases the apical and cardiac lobes are practically completely consolidated, while the diaphragmatic lobes may show quite a large amount of air-containing lung. In some cases the consolidation is patchy, with air-containing lung between the areas of consolidation.

In the consolidated portion the color on section is a mottled gray and dull red. The small lobules are sharply defined and about 3 mm. in diameter, each standing out from the cut surface as a plug of gray material, giving a coarsely granular appearance. In one case the consolidated portion of the lung had scattered through it minute points of calcification. In some cases a mucopurulent material is found in the bronchi in the solid portion, and a similar substance can be squeezed from the lung parenchyma.

In one set of lungs which showed the typical lesions of this disease there were several abscesses exactly similar to those found in caseous lymphadenitis. This fact, together with the bacteriological findings in several cases, points to a possibility of a close relationship between these two conditions. In another case there was a much enlarged and caseous precrural lymph gland. However, as these lesions have been seen in only two sheep, it may be that the two conditions were present independently in the same animal.

The only constant pathological condition outside of the lungs has been in the bronchial and mediastinal lymph glands. In all cases they have been enlarged and somewhat friable, with a moist, fatty appearance. The color of the cortex of the glands is very light, contrasting with the dark medullary portion.

HISTOPATHOLOGY

Histologically this condition presents a very interesting study. In general it may be described as a chronic interstitial bronchopneumonia, corresponding to the acute interstitial bronchopneumonia described by MacCallum[1] in his work on the pathology of streptococcus pneumonia. In combination with this interstitial bronchopneumonia we also find in the sheep cases of lobular pneumonia, as described by MacCallum as occurring with the streptococcus bronchopneumonia.

The histological picture of course varies according to the stage of the infection, the different stages being found in the same lung, due to the progressive nature of the disease. In the typical cases the general picture is as follows: In the air-containing portions of the lung the principal change is the infiltration of the walls of the alveoli with small mononuclear cells, and a similar peribronchial and perivascular infiltration. There are at various points tubercle-like accumulations of small mononuclear cells, usually in relation with the wall of the bronchus or bronchiole. The infiltration of the alveolar walls varies in amount, it being in places so extensive that the lumina of the alveoli are completely obliterated. In this portion of the lung there is little exudate into the alveoli, although some of them contain an exudate consisting of epithelial cells and small mononuclear cells.

In the consolidated portions of the lung there is a good deal of variation in the picture presented. In the more chronic cases the consolidation seems to be due principally to an extensive interstitial infiltration with small mononuclear cells, obliterating the lumina of the alveoli, and a proliferation of connective tissue strands. The bronchi usually contain plugs of cellular exudate consisting principally of leucocytes. In some places, where the alveoli are not obliterated by the infiltration of small mononuclear cells, they are plugged with exudate consisting of epithelial cells, leucocytes and small mononuclear cells. There were found some places where the epithelial cells of a group of alveoli had changed to a cuboidal type, giving the appearance of cross sections of a mass of bronchioles.

In the more acute cases there is engorgement of the blood ves-

[1] MacCallum, W. G. The pathology of the pneumonia in the United States Army camps during the winter of 1917-1918. Monograph of the Rockefeller Institute for Medical Research, No. 10, 1919.

sels and the capillaries of the alveolar walls, with some hemorrhage into the walls of the alveoli and into the bronchioles. The cellular infiltration into the walls of the alveoli contains some large mononuclear cells and leucocytes. The alveoli and bronchi contain cellular plugs consisting mostly of leucocytes. These coalesce in places to form tubercle-like foci of pus cells, in the center of which necrosis takes place. Giant cell formation is found in the cellular exudate in these cases.

SUMMARY

In this paper we have described a chronic progressive pneumonia of sheep which has been observed in Montana for a number of years, and which causes an annual loss of from 2 to 10 per cent in infected bands. The pathological condition apparently is confined almost entirely to the lungs and the thoracic lymph glands, and there are no recognizable symptoms until the involvement of the lung is sufficient to cause labored respiration. There seems to be no systemic disturbance. The appetite remains good, and the gradual emaciation and death are apparently due to the mechanical interference with respiration.

From the study of pathological material from 22 cases of the disease we have described the condition as a chronic interstitial bronchopneumonia. The gross appearance of the lungs and bronchial and mediastinal lymph glands is characteristic. The histopathology of this pneumonia has been described as it appears in the different stages of the disease, and the condition seems to be peculiar and different in some respects from types of pneumonia which have hitherto been described.

The question of the etiology of this condition has not been discussed to any extent. We believe that it is an infectious disease, and we have done a large amount of bacteriological work with our laboratory material, with the result that we have isolated two pathogenic organisms, one or both of which may prove to be primary causative factors. We are continuing our study of the disease, and are at present carrying out bacteriological experiments on sheep in cooperation with the Montana Agricultural Experiment Station.

NEED FOR ORGANIZATION [1]

By W. E. Frink, *Batavia, N. Y.*

WHILE it is probable that our profession would be farther advanced and our wishes would have received more recognition had we, long ago, organized for protection, this has until recently seemed unnecessary.

The New York State Veterinary Medical Society, organized over thirty years ago, had for its main object the promotion of good fellowship among the profession, and it afforded an opportunity to meet once each year, renew acquaintances, discuss interesting topics and air grievances. The Society has continued to flourish and no one can question its usefulness, although at the present time less than 50 per cent of the eligible veterinarians are members.

The need of some strong organization not only to promote our individual interests but to defend the profession against what promised to be a flank attack was realized when certain interests, for reasons rather vague, endeavored to popularize the impression that the profession was divided as to methods and policy in the matter of disease control. Luckily the word "principle" was not used, as this was the flag around which the defenders of the situation rallied, and whatever the object of the propaganda, the result was to arouse the thinking men of the profession to action; and as a result, I believe, more has been accomplished for the future of the profession than could have been done in any other way. According to Hon. B. A. Pyrke, Commissioner of Farms and Markets, this is probably the first time in history that the veterinary profession has been instrumental in shaping the State's policy. Therefore I believe that organization at the present time is a most important subject for the veterinarian's consideration.

As we look about us in all lines of human endeavor we see each important one functioning not through individuals but through representative bodies of such individuals. Even the skilled workers whose numbers run into the hundreds of thousands have their unions, through representatives of which all questions concerning the welfare of the individual are settled. How much

[1] Presented at the thirty-second annual meeting of the New York State Veterinary Medical Society, Syracuse, July 26-28, 1922.

more necessary it is for our profession, one of the fewest in numbers and possibly the least understood, to have some strong central body to represent us in questions involving our future success or failure.

The time is come when the veterinarian has more responsibilities than simply treating the individual cases as they arise in his field. His scope is more that of a consulting sanitary engineer for the breeder and livestock owner. The great interest shown and capital invested in the large breeding establishments have opened a new field, and the traffic in dairy and breeding stock incident to the foundation and maintenance of such breeding centers, and the interchange of animals necessary to the improvement of herds already established, have added a host of responsibilities particularly to the private practitioner if he is to be efficient and perform his share of the duties in the control or eradication of the diseases that menace our livestock industry.

The character of the work now demanded of the practitioner requires that he keep well informed of the new knowledge we are constantly acquiring regarding these diseases, as well as the regulations of the different State and Federal bureaus regarding segregation, quarantine and other details in the handling of the same and in the interstate movement of livestock. He is brought in contact with the officials of the different State and Federal bureaus, and the results of his efforts are no longer limited to the confines of the small territory in which he works but extend to other counties, States, and perhaps foreign countries.

The character of the work, particularly the tuberculin testing of cattle in the attempt to control and eradicate tuberculosis, naturally requires that the technique of application and interpretation of results be as uniform as possible in order to prevent later confusion in the movement and retesting of the animals. The laws and regulations of the different States should also show as much uniformity as possible for the same reason.

The amount of this work now being performed by the veterinarians scattered widely throughout our State, and the probability of a great increase in the demand for this kind of service, suggests to us that for the increase of efficiency and at the same time the protection of the individual veterinarian and the profession as a whole, an attempt should be made at this time to organize a strong central body to promote cooperation and harmony among the different groups of men carrying on this im-

portant work. Representatives of this organization could make demands, recommend and support measures, request changes in the regulations, investigate charges, and otherwise look after the welfare of the profession.

It has been publicly stated that on account of the loose methods of some of our practitioners in tuberculin testing, fifteen States have felt it necessary to enact a special quarantine on cattle from the Empire State unless accompanied by a health certificate signed by a Federal inspector. An investigation of this statement reveals the fact that it is untrue. It is true, however, that enough "loose" testing has been done by a few individuals to bring our cattle into disrepute in other States, thereby working a hardship upon and creating a serious menace to our cattle industry. Not only this, it has caused the most scathing criticism, not of the individual veterinarians who were guilty of these acts, but of the profession as a whole. It is another example of the innocent being punished with the guilty, and so far nothing has been done to establish their innocence or place the guilt where it belongs.

Cases have arisen where cattle tested by men of good standing reacted upon retest. These men have been summarily removed from the list of veterinarians approved to do this work without an opportunity to vindicate themselves. With an organization such as we suggest to take up these matters with the officials in the departments, a thorough investigation could be made, and if there were evidences of omissions or commissions on the part of the veterinarian, a recommendation to the Board of Regents that his license be revoked could be made.

If the veterinarian who might be susceptible to influence to make loose or inaccurate tests of animals or groups of animals knew that a field agent of a representative body of his brother veterinarians was liable to appear to check up his work, possibly to conduct a retest, he would be apt to give more thought to his responsibilities as a veterinarian, conduct the test in a more efficient manner, and be more reluctant to yield to the pressure of unscupulous breeders or dealers whose main desire seems to be to secure a health certificate for their animals regardless of the consequences either to themselves, the veterinarian, the cattle industry or the public.

There are in this State approximately 550 veterinarians registered by the Board of Regents. A considerable number of

these men have been given a license to practice over the protest of this Society, by amendments to the veterinary practice law and very liberal interpretations of the same. Some of these men perform their work as far as they are able in a conscientious manner, but they lack the preliminary and technical training to do credit to a profession, for they are in no sense professional men, having been granted a license as a result of circumstances rather than as a result of education and fitness.

It is possible also that some of the graduate men have failed to realize their responsibilities as professional men and have been guilty of deceit or negligence that is a discredit to our profession, and this has added to the already prevailing idea that the veterinarians of this State are not to be trusted.

Our organization could investigate the methods of the men who are accused of unfair or incompetent work, and whether they are graduates or nongraduates, members or nonmembers of this Society, should act on the principle that a profession to exist as a profession and develop as ours should, under the stimulus it should receive from the higher preliminary and more efficient technical education possessed by the newer additions to the same, as well as the increased knowledge of disease constantly being gained, thereby broadening the scope of our field of activities, make their recommendations to the proper authorities as to whether these men are a credit to the profession and interested enough in its welfare to be allowed to continue.

Again, the discoveries and new methods of handling and control of disease, as well as the discoveries of new diseases, have been worked out by an entirely different group of men than those who have been so busily engaged in developing our livestock industry. We are, therefore, in need of some means of closer contact between the veterinarian and the breeder, some practical way by which the needs of the latter may be ascertained and he at the same time be educated as to the possible assistance he might receive by making use of his veterinarian in his effort to establish and maintain a herd free from the diseases that are bound to cause him economic loss unless he approaches his problems with caution and judgment and fortifies his establishment with the sanitary and hygenic equipment necessary to the comfort and health of his animals, for without these they can never be a profitable investment.

An active field agent or secretary of an active society or associ-

ation could confer with the breeders and men interested in the welfare of our livestock, ascertain their needs, make recommendations and cooperate with them to this end. He could meet with the committees of the various breeding associations and other agricultural organizations where matters of public interest are being discussed, lend his assistance directly or indirectly in the formation of measures, and recommend changes in the regulations of the departments in control, if such changes seemed advisable, thereby assisting in the handling of the problems that are every day becoming more numerous and complex.

Among the many responsibilities of the veterinarian is one of no mean importance if we are to make the progress we should. I refer to his implied duty to the State in return for the special privileges granted him. A man licensed to practice, possess, handle and prescribe drugs, serums, etc., for which he may charge a fair profit, and to perform operations, specific tests, etc., for which he may charge and collect under the law, as well as fair fees for expert testimony in cases where his knowledge and special training make it valuable, should feel that something is due the State in return. He should at least feel it his duty to make every effort to be prepared as far as he is able to perform in a professional manner *all* the services required of him, or see that the owner is brought in contact with someone who can do so.

In some sections the practitioner has been criticized because he openly stated that he did not have time for poultry diseases or did not care to administer serum or serum and virus to hogs, or he had plenty to do without tuberculin testing. Many owners have suffered losses because of this attitude of the local veterinarian or have been obliged to seek outside assistance. These remarks have been taken up by farm bureau and other organizations and made the basis of statements that the profession did not care for such work and it would have to be done by others.. I believe the veterinarian who neglects these opportunities to serve his State is guilty of an omission, and our proposed field agent or secretary could investigate cases of this kind and attempt to impress upon the indifferent practitioner the seriousness of such an attitude to the profession and urge him to shoulder his share of the responsibilities. If he still insisted that he did not care for the work, it should be seen to that a man was placed in that locality who did care for the work and was competent to perform it.

Many of you who are practitioners have no doubt noticed the weight, sometimes amounting almost to awe, which the opinion of some veterinarian connected with the State or Federal department received when he happened to be asked to diagnose some condition or express judgment in the matter of tuberculin testing. Was it because of his greater knowledge or skill? No; it was because of his connection with such a department, giving him a reputation for superior wisdom that many times he did not possess.

With a strong organization and a unity of purpose to perform our service in a scientific and conscientious manner, our members could soon establish a reputation for skill and integrity that would be far superior to the one now uppermost in the minds of the laymen.

I can see no reason why there should be friction between the practitioner and men engaged in so-called State or Federal work. If each attended strictly to his own business they should cooperate and be the best of friends.

It has been reported that when cattle tested and condemned by local veterinarians arrived at the place of slaughter, the officials in charge of the postmortem work have enlightened and at the same time dissatisfied the owner by informing him that he had wasted his money in paying for a private test, as the State employed a corps of specialists for that very purpose. This I consider a gross breach of professional ethics, as not even a tradesman would endeavor to interfere with a competitor's interests in such a manner.

Other instances have been noted where official postmortems have been conducted in a negligent manner, this being unfair to both the veterinarian and the tuberculin test. There is at the present time no one in authority to investigate and disprove or confirm the same.

It seems to me that our present association, the New York State Veterinary Medical Society, could be made to meet the present need for organization if the interest and whole-hearted support of the profession in this State could be secured. The practitioners are the ones who should be most vitally interested in the future, and just how much state medicine is to interfere with their source of income should be one of their problems. I consider it the duty of each and every one of these men to become affiliated with their local and State associations and take

an active part in the affairs of the same, that their interest may receive some consideration when problems concerning them are being studied and solved.

Thse suggestions could become realties, we believe, through this association by the election or appointment of a field secretary or agent whose duty would be to assist in bringing about the cooperation of the veterinarian, the State and Federal departments and the livestock owners.

This may be nothing more than a dream on my part, but it seems to me that the time is come when our profession, both as individuals and as an organization, should take a more active part in the formation of the livestock sanitary laws and indirectly in matters pertaining to public health. The veterinarian is by the nature of his training and experience the one man who can intelligently advise and cooperate with those directly interested in these questions that are increasing in importance every day. We have seen numerous instances where questions involving the scientific knowledge necessary in matters of disease control have been handled by laymen with a result discouraging, if not disastrous, to the breeders, and, to say the least, not elevating to our profession. If we as an organization took a more active part in these affairs of public interest there would be less need for them to be handled by laymen and less discontent among the profession regarding the activities of county agents and others. The livestock industry needs us as willing cooperators, not as disgruntled individuals, and if we stand ready and willing to perform a service our opportunity must come.

"United we stand, divided we fall," is as applicable to our profession at this time as it was to the thirteen original colonies when they were threatened with disruption, and the same earnest "honest-to-God" effort on our part will bring about a unity of purpose, and as a result we shall take and maintain the position of responsibility and respect in the eyes of the world that our profession both by its purpose and activities honestly merits.

We must not for a moment forget that such organization is not alone for our benefit but will enable us to render more efficient service to the livestock owner, for whom the profession was evolved and to whom it is dedicated.

THE PRIVATE PRACTITIONER, THE SALT OF OUR PROFESSION [1]

By J. G. FERNEYHOUGH
State Veterinarian, Richmond, Va.

THE MAN who does things (not just the one who knows how) is the man who really develops his country and assures his followers of success. You men who spend your time and energy in actual practice are the pillars of our profession, because you are taking the risk when you carry into practice the theories of the laboratory man. It is not the inventor of a machine who is apt to be killed if it proves faulty, but the poor devil who is game enough to fly it. The surgeon in a quiet room, cooled by a fan, writes what must be cut and how it should be done. His discoveries were doubtless made when experimenting on an animal securely strapped to the operating table, with plenty of help and all necessary equipment at hand, and the animal in question merely a "subject" whose life or death concerned no one. Contrast this with a practitioner called in to save a man's valuable animal, probably in some out-of-the-way place, with no help at hand, and his practice at stake. Yes, his very living, among many other things, he must consider quickly. It takes courage combined with knowledge, skill and wisdom to make a successful veterinary practitioner, for here it is that the "tree is known by its fruit."

For these reasons it ill becomes an official veterinarian, whether he be employed by the State or the Bureau of Animal Industry or is a member of some college faculty, in any way to ignore, slight or belittle the veterinarian who gives his life's work to the practice of his profession. The State man, the bureau man and the college professor receive monthly salaries, which they know will be available; but the practitioner is the man who takes the chance. He so often tries to work out plans which must necessarily be the making of the man who first thought of them if all goes well, but the ruin of the practitioner if things go wrong. In and out of season we make the practitioner the goat—someone has to be. Then it surely behooves us in official work to recognize, and what is more, acknowledge to the profession that the

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

practitioners, as a class, are the very salt of the veterinary profession.

During the last twenty years I have devoted my time to the duties of State Veterinarian, and thus have been thrown constantly with the practicing veterinarians. I know them. I know not only what they can do, but what they have done, are doing, and, what is more, what they are going to do. I do not know about other States, but I dare say no man will be State Veterinarian of Virginia for a period of twenty years unless he does know and appreciate the practitioners of the State.

Of course the practitioner, like the official, must be a respectable and honorable man to start with, and a student of his profession. He must behave and respect himself, or others will not respect him. He must regard the confidence of his colleagues, and especially he must be absolutely honest and fair with his clients. When this has been done on his part, then it is the duty of the official veterinarian to stand up for, support and appreciate the veterinarian in daily practice. We can assist him in two ways. First, by referring stock owners to their nearest qualified veterinarian, when they come to us for advice and we know it is work for a private veterinarian to handle. In the Virginia office I keep a map dotted with red-head pins denoting the location of every veterinarian in the State. The practitioners are listed by counties as well as alphabetically, and I can advise any person at a moment's notice as to the location of his nearest veterinarian. I have occasion to do this daily. Secondly, as officials we can go before the legislature and use our influence in preventing "quacks" from obtaining special permits to practice, and thus uphold the law. I have had the honor of being Chairman of the Legislative Committee of the Virginia Veterinary Medical Association for fifteen years, and while one or more bills have been introduced at each session of the State Legislature which would permit persons to practice within this State who have not been qualified to do so, no such bill has been passed in Virginia for the last fifteen years..

In fact, we who are in official work can do much toward helping the practitioner, provided we constantly bear in mind that it is not only our duty but a privilege to strengthen the veterinary profession by supporting the work of every competent, qualified veterinarian who is practicing our profession. The man in practice is a veterinarian in the broad sense, because in the

course of time he must necessarily deal with each and every branch of the profession.

Of course you can not help an individual unless he wants help. Not only must he want it, but, what is more, he must appreciate it, and respond to the willingness of those who desire to help him succeed. In other words, it must not be one-sided, but thoroughly cooperative. This cooperative spirit must actually exist between the practitioner and the official, and then the differences will be few and far between. We all find trouble without looking for it, but in order to attain success we must constantly help others overcome the obstacles of life, for nothing makes one happier than to realize that he has actually done something to make life brighter for someone else.

DISCUSSION

DR. FERNEYHOUGH: I find among the members present this morning a gentleman who has missed only one meeting of the A. V. M. A. in twenty years, and everybody would excuse him then for he missed that meeting to go to a horse race. That gentleman is Dr. Otto Faust. He has attended these meetings eighteen years in succession, and I want to say to you that I don't know anything that I would appreciate more if I opened the JOURNAL and saw the photograph of that gentleman, a practitioner who attended the meetings for eighteen years. When you start advertising your practitioners for what they do, then you are going to have your practitioners attend your meetings. Now, gentlemen, I tell you I believe we have got to start in after each meeting and do something to bring some practitioner to light; start with your oldest men, they will not be with you always; that is why I mentioned the modest gentleman here. You have a splendid opportunity to recognize the services of a practitioner. I don't ask you to publish any five or ten thousand pamphlets to be sent out and published in newspapers; I merely ask that the photograph of this man be placed in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, in view of the fact that for eighteen years he has never missed a single meeting of the A. V. M. A. Start that now; it is your work, and then you will go to the front.

Did you ever see a man succeed in business unless he looked out for himself? You can call to mind some public men who are always doing something for somebody else, and he will die and somebody will have to bury him, and everybody will say: "It is a pity that poor fellow didn't make a success in life."

You practitioners here must look out for yourselves. How many are here this morning? I don't blame them for not com-

ing. I didn't want them to come to hear me, but, gentlemen, how many practitioners are here this morning to hear some one say something in their behalf? I wrote to Dr. Mayo and told him that I would like to have something to say to the practitioners, and I came here, but how many practitioners are here?

You have got to have a reason for what you do, and you have got to line up. If I can do no more than start this, I do hope

DR. OTTO FAUST
Practitioner of Poughkeepsie, N. Y.,
a Worthy Son of a Noble Father

Breathes there another in our ranks with loyalty so true,
With keener sense of membership, of duty's broader view?
A worthy trait of brotherhood his faith and trust inspire.
Let us his action emulate—son of a noble sire.
(*With apologies to Sir Walter Scott.*)

you will take this seriously; I do not know of one man in your Association who has been so faithful. Put this picture in the JOURNAL as being a practitioner who has attended this meeting for twenty years, and follow it up, gentlemen, every year, with the picture of a practitioner, and you will see more interest. You have got the power, but don't let somebody flatter you and get it away from you.

I have been tied up in educational work so long that I sometimes think we are going wild over education and universities and colleges. I don't want to take from them, but I find when you talk to the best college men that they are right with us. It isn't the fault of the college man, but it is the fault of the man outside that doesn't seem to appreciate it, and I think it is the fault of you practitioners not fighting for your own. I do want to see you start at this meeting today to take some recognition of this practitioner and other practitioners who have done nothing but practice.

CHAIRMAN KINGMAN: We appreciate these kind remarks.

DR. FERNEYHOUGH: I never start a thing and lose out. I am in dead earnest about this. I would like to see some one make a motion that this photograph business be started. We have got the worthy practitioner here. I would like to see someone make a motion that Dr. Faust's photograph be published in the JOURNAL with that history of attendance. It will make others attend, I know.

DR. FERGUSON: I didn't just hear who that practitioner was who attended eighteen consecutive meetings, but I presume it is Dr. Faust. At any rate, I take pleasure in moving that his photograph be reproduced in our JOURNAL in an early issue.

(The motion was seconded and carried.)

CHAIRMAN KINGMAN: We can express our appreciation here by giving Doctor Faust a hand, since he happens to be present. (Applause.)

DR. FERGUSON: Mr. Chairman, I would, on behalf of the practitioners, express appreciation for the kindness of the doctor that spoke in behalf of the practitioner. We surely appreciate his interest in our welfare and appreciate the fact that he is with us good and strong.

DR. CALDWELL: We gave quite an ovation to a man last night. We have had just now a paper and a talk by a man who is not a practitioner, but he is defending the practitioner, and not only defending him, but he is doing as much as he can in his behalf. Therefore, I second Dr. Ferguson's motion.

CHAIRMAN KINGMAN: It has been moved and seconded that it be made a matter of record that this section wishes to make known its appreciation of the efforts of Dr. Ferneyhough on the part of the practitioner.

(The motion was carried.) (Applause.)

TUBERCULOSIS IN ITS RELATION TO THE FEEDING AND MARKETING OF LIVESTOCK [1]

By Prof. Howard R. Smith

Livestock Commissioner, The National Live Stock Exchange, Chicago, Ill.

IN CONVERTING farm feeds into meat and milk products for the most profitable returns, consideration must be given to the digestible nutrients in various feeds, current market values on such feeds, and their proper blending in the ration.

Of equal importance to the feed supply is the type of the animal—one having large digestive capacity and capable of producing a product of superior quality.

Last, but not least, is the health factor. Most diseases are manifested by outward symptoms. The owner becomes concerned and seeks necessary treatment. This is not ordinarily true of tuberculosis, because the owner is, in most instances, unaware of its presence in his herd. It is the insidiousness of tuberculosis that is chiefly responsible for its great prevalence throughout this and other nations today. It is unfortunate that the tuberculosis bacillus was not discovered sooner and that steps were not taken earlier to combat it. That it is a factor which materially increases the cost of producing meat and milk can no longer be ignored.

Out of a total of 39,416,439 hogs slaughtered under Federal inspection during the fiscal year ending June 30, 1922, 5,640,081, or 14.3 per cent, were retained for tuberculosis; 70,304 or 0.18 per cent were condemned as inedible; and 95,809, or 0.24 per cent, were sterilized. Dividing the total loss at current market values on condemned pork and its by-products by the total number of pounds of hogs, including healthy as well as tuberculous hogs, slaughtered under Federal inspection during the year 1921, we find that the average loss on all hogs killed was nearly 10 cents per hundred pounds live weight. That represents the toll exacted by tuberculosis in pork production—a serious handicap to the industry and one which has been steadily increasing from year to year.

In realization of this loss, which is in large part eventually

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borne by all producers, for the packer must take into consideration the condemnation to be expected according to the law of averages, The National Live Stock Exchange at the last annual convention held in Kansas City passed resolutions urging all hog buyers to pay a bonus of 10 cents per hundred on hogs bred and fed in tuberculosis-free counties. At a meeting of the packers called by Mr. Everett C. Brown, president of The National Live Stock Exchange, these resolutions were presented and accepted by the Big Five, as well as many smaller companies in the Middle West. It was admitted by them that they could afford to pay 10 cents per hundred pounds more for hogs from a tuberculosis-free area than the average run of hogs of the same quality that come to the markets. Enough have already consented to make it seem probable that at the next meeting of the Institute of American Meat Packers, to be held in Chicago next October, it will be approved by practically all concerns. It seems to me but fair to give this recognition to the people of any county sufficiently enterprising to make appropriations for county-wide tests on all herds of breeding and dairy cattle, which, with the slaughter of the reactors, should remove the chief cause of tuberculosis in hogs.

There are now a large number of counties in the United States that are successfully eradicating tuberculosis from the herds within their boundaries. I can not refrain from taking pride in the county work being done in my home State. We have in Michigan 22 counties which have provided funds ranging from $2,500 to $15,000 each for one year's work. This money is appropriated out of county funds on the basis of approximately 25 cents per head for the breeding and dairy cattle population of the county. This is to cover operating expenses. The indemnity is paid out of State and Federal funds. While this county work has been under way less than two years, we already have seven counties that have been once tested. Hillsdale County, the first to be completed, is due for another complete test next October. Of 218 infected herds thus far retested, comprising 2,798 cattle—more than half the entire number of infected herds on first test—there were found on second test only 56 reactors, and these were confined to 35 herds. There are now not to exceed 60 infected herds representing less than 100 infected cattle in the entire county, and this number will be greatly reduced during the next six months. We expect in the near future to receive a bonus of

$10,000 per year on our hogs in Hillsdale County alone, to say nothing of the increased value on our breeding cattle.

In this connection I wish to say that the success of the Michigan work in the eradication of tuberculosis is due in large part to the attitude of our people and the fact that it is cooperative between the county government, the State and the Federal Governments. I believe greater success comes to such an enterprise when the people in the local community provide a part of the funds, preferably by county tax. The teamwork of Dr. Rich, the Federal inspector in charge, and Dr. Killham, State veterinarian, has shown what subordinating the personal credit factor for results can really accomplish in cooperative work of this character.

County-area work, which means so much to the owners of grade breeding and market stock as well as to the owners of pure-bred herds, is also moving forward with pronounced success in Missouri, Nebraska, Wisconsin, Illinois, New York, Washington, Oregon, and some of the Southern States. It is an efficient, economical and thorough system of eradicating tuberculosis which is fast bringing the support of all people in securing adequate appropriations.

Tuberculosis in steers and feeding heifers is not so large a factor in increasing the cost of production as in hogs because of the small percentage of tuberculosis among young feeding cattle, but it is an important factor in feeding cows for beef or for milk production. It is no exaggeration to state that an average of 10 per cent of the cows which come to our northern markets have tuberculosis, many of which are in such an advanced stage of the disease as to preclude the possibility of using feed to advantage. Many of these cows will remain thin, regardless of the amount of feed supplied. The removal of reactors from our dairy herds will not only prevent the further spread of tuberculosis in the herd but it will eliminate heavy losses on feed that is being wasted on cows incapacitated by tuberculosis. This is costing the Nation millions of dollars annually, probably much in excess of the losses on condemned beef and pork.

While the problem of eradicating tuberculosis is a costly one for the time being, it will prove to be one of our profitable investments. An expenditure of eight million dollars annually for five years will come near eliminating an annual loss of approximately forty million dollars caused by tuberculosis. While the

five years of work, which has really been an organization period, has not reduced as yet the condemnations on hogs in the Nation as a whole, it has reduced the number of cattle retained for tuberculosis from 2.6 per cent in 1916 to 1.9 per cent in 1922. This is very encouraging. Many of you are actively participating in this great enterprise which is being watched with keen interest by foreign nations. All can take pride in this accomplishment.

The various interests at the market centers, in full realization of the seriousness of the tuberculosis situation, have been sponsors of this campaign from its beginning. Funds have been subscribed for the employment of a livestock commissioner at each of the principal markets, to devote his entire time to the promotion of this work through educational means. The following markets are now participating: Chicago, St. Louis, Omaha, Kansas City, St. Joseph, St. Paul, Sioux City and Milwaukee, all of which work is supervised and coordinated through The National Live Stock Exchange.

If success eventually comes and the disease is reduced to a minimum, which we know now is possible, it will be the result of an efficient Government organization from Washington to the various States and counties, and a spirit of cooperation which comes from love for and loyalty to our Nation.

MACKELLAR GOES TO WASHINGTON

Dr. W. M. MacKellar, a veteran in the tick-eradication work of the Bureau of Animal Industry, has been appointed assistant chief of the Tick Eradication Division in that bureau, effective November 16. Doctor MacKellar directed the successful eradication of cattle ticks from the State of California, the work covering the period 1906 to 1916 and including an area of nearly 80,000 square miles. Upon completion of the work in that State, he was placed in charge of Federal work in Georgia, and cooperated with State officials in the eradication of cattle ticks from 80 counties. He is the author of a recent circular entitled "How to Get the Last Tick," which is used widely in States where infestation still exists.

Doctor MacKellar's appointment to the Washington office is largely a recognition of his ability as an expert in tick eradication and quarantine activities and of successful work in organizing field forces and winning cooperation of State and county officials and livestock owners.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

SARCOMATOSIS IN A COW

By R. A. RUNNELLS

Department of Animal Pathology, Michigan Agricultural College, East Lansing, Mich.

A CASE of unusual interest both from the clinical and pathological standpoints came under the observation and care of the Veterinary Division of the Michigan Agricultural College some time ago. From the clinical standpoint it was of interest because the symptoms which led to a diagnosis of traumatic pericarditis proved to be due to an unrelated and uncommon condition although involving practically the same organs. From the pathological viewpoint the case attracted interest because a condition of this nature is rare and the anatomical alterations were so marked that it was difficult to understand how the patient survived until they became so extensive.

History.—The patient was a purebred Holstein cow which three months previously began to show symptoms ordinarily manifested by cattle suffering from traumatic gastritis and pericarditis. During this period there were times when the symptoms were quite pronounced and others when they seemed partially to subside. An unfavorable prognosis was given the owner, but he decided to allow the cow to live until her period of gestation terminated, because she was a well-bred animal and considerable value was attached to her offspring. She gave birth, three weeks prematurely, to a living bull calf, and was then brought to the hospital for treatment, if deemed advisable, or for autopsy if treatment was thought of no avail. The latter was decided upon at the end of a week because the symptoms became greatly aggravated, partly due undoubtedly to the weakened condition in which the patient had been left after the parturition of the previous week.

Symptoms.—At the time of slaughter she was extremely emaciated; there was moderate edema of the brisket and abdomen;

she remained in a standing position almost constantly; the fore limbs were placed well apart with the elbows pointed outward; splashing heart sounds could not be detected; there was moderate diarrhea.

Anatomical Alterations.—A diffuse mass of what appears to be neoplastic tissue spreads over the outer surface of the reticulum where it comes in contact with the diaphragm. This mass resembles lymphoid tissue. As is not uncommonly the case, the reticulum contains several foreign objects such as tacks, nails, pins, screws and small bolts, but at one point a brass pin about 5 cm. in length has penetrated the reticular wall for a distance of about 2 cm., but still lacks about 1 cm. of reaching the outer surface, due to a marked thickening of the wall and the presence of the neoplastic tissue at this point.

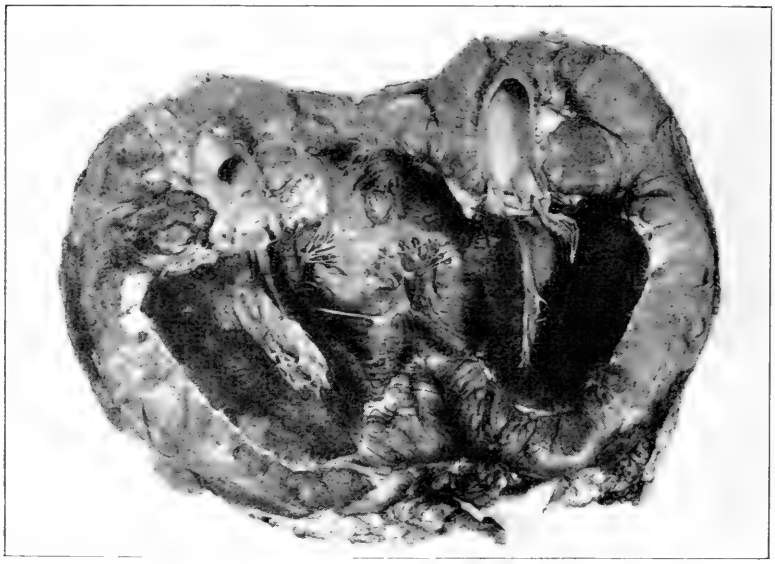
A considerable quantity of ascitic fluid is present in the abdominal cavity.

The liver is unevenly colored. Light yellowish brown irregularly shaped areas varying from a pin point to a centimeter in diameter alternate with relatively small areas or bands dark reddish brown in color. The lighter areas are quite uniformly distributed throughout the organ. No other marked alterations are observed in the abdominal cavity.

In the thorax is a large quantity of fluid similar to that observed in the abdominal cavity. The heart is much larger than normal and shaped more like a large ball than a cone. (After having stood in 10 per cent formalin solution for several weeks it measured 45 cm. from the base to the apex, and the circumference at the coronary groove was 95 cm. The organ was not weighed.) The pericardium is adherent to the epicardium in most places. Upon opening the heart from the base to the apex the cut surface presents two distinct layers, the inner consisting of heart muscle and the outer apparently of neoplastic tissue. The inner heart muscle layer appears as a relatively narrow band, normal in color but considerably thinner than the normal myocardium. This is more conspicuous in examining thin sections made from the base to the apex. In places the myocardium of the right ventricle is only 8 mm. in thickness and the left ventricle 4 cm., while the outer neoplastic layer presents a rather constant thickness of 8 to 10 cm. over the entire outer heart surface. There is a sharp line of demarcation between the two layers and apparently no infiltration

of the myocardium by the neoplasm. In sections made from the base to the apex the inner reddish brown layer and the outer pale gray layer present a marked contrast. The latter consists of whorls of light gray areas which seem to emanate from the heart muscle and are interspersed with and separated by darker bands of tissue which are firmer in consistency and have the appearance of having developed with more regularity. That is, these bands appear to consist of fibers running parallel to one another in contrast to the whorls of less dense and apparently less organized tissue. The neoplasm appears to have its origin in the epicardial connective tissue. As stated before, the pericardium is adherent to the epicardium in most places, though it can be separated at others.

In the accompanying illustration the myocardium of the ven-



Small round cell sarcoma.
Heart of cow.

tricles appears much thicker than is indicated above, but it will be noted that the heart was sectioned close to the interventricular septum, which was apparently not involved.

Histopathology.—Portions of the neoplastic tissue from both the heart and reticulum and portions of the liver were fixed in Zenker's fluid, imbedded in paraffin, sectioned, and stained by

Mallory's eosin and methylene blue method. In addition portions of the liver were fixed in osmic acid.

Sections from the heart and reticulum show the tissue to be richly cellular. The cells forming the mass of the tissue are about 2 to 4 times as large as red blood cells, round or nearly round in shape; their nuclei are large, staining deep blue on account of the dense arrangement of the fine chromatin granules. Cytoplasm surrounding the nuclei is not discernible. The intercellular stroma of fibrous connective tissue is not abundant except in an occasional area where it is much increased in amount and appears to be rapidly proliferating. In these areas the small round cells are massed in clumps or nests. Most fields shows numerous newly formed capillaries. The structure of this neoplastic tissue places it with the sarcomas of the small round cell type with slight alveolar arrangement.

In sections of the liver the usual radial arrangement of the cords of liver cells is not observed. The parenchymatous cells for the most part appear as large, clear vacuoles, with or without nuclei. Where present the nuclei are pushed to one side, giving the cell a signet ring appearance. Some nuclei stain well with methylene blue, others only faintly and appear shrunken, while still others are not in evidence at all. The sections fixed in osmic acid demonstrate that the large vacuoles seen in the eosin methylene blue sections are fat globules. The liver apparently presents two distinct fatty changes, namely, fatty infiltration and fatty degeneration. This combination of changes can probably be accounted for in a case of this kind. Lowered oxidation due to impairment of the cardiac function might possibly lead to the former, and the intoxication due to or resulting from sarcomatosis could quite probably produce the latter.

In addition to the fatty changes in the liver there are numerous hemorrhages of varying ages. In the more recent ones the red cells are intact; in older ones they are hemolyzed, and in still older ones there is organization in various stages up to complete fibrosis.

ABORTION DISEASE OF CATTLE

By DON. A. BOARDMAN, *Rome, N. Y.*

WRITING a paper on this subject, one finds a great conglomeration of conflicting theories, hypotheses and facts gleaned

from the literature. Let that be as it may, most investigators agree that the causative factor is *Bacterium abortus*, the Bang organism. Of course there are some other causes of a direct and secondary nature. The mode of infection seems to be through the digestive tract, through the blood stream to the reproductive organs of the female, where it causes either premature expulsion of fetus, a dead fetus at full time, or an apparently healthy individual with retention of placenta, depending upon the severity of the infection and the resistance of the individual animal. The consensus of opinion seems to be that the disease is most easily spread through the vaginal discharges of the aborter during the sixty days following calving. Complete segregation of the animal for this length of time should aid in the prevention of spreading the disease.

A combined economic loss of the breeding power of affected animals plus the resultant retained placenta, sterility and decreased milk production cost this country more money than any other cattle scourge. The treatment of this disease is in the experimental stage. Numerous investigators and research workers have found no specific panacea which satisfactorily copes with the situation. The treatment ranges from the practice of allowing the afflicted cow to shift for herself, selling her to the butcher or to some unsuspecting buyer, to calling in more or less effective professional aid. It is a well-known fact that abortion storms will sometimes clear up in one or two years and not trouble the owner again. In other cases a man never eliminates it from his herd.

The veterinary profession has been trying to cope with the situation for the past several decades, has discovered much about the disease, but as yet is still somewhat in the dark. Serums, bacterins, vaccines and nostrums have been put on the practioner and stockman alike with pretentious claims for their effectiveness, but as yet few, if any, are effectual.

The breeding of noninfected cattle with a clean sire, and keeping such priceless individuals completely isolated from any source of contagion, would be the acme of perfection.

The general practitioner has probably followed the new theories and treatments which have come to his attention. In my limited experience I have tried a few of the various treatments.

In 1920 I had a run of abortion ranging from 10 to 46 per cent of the herd. I will cite my experience on one of these farms.

Sixteen head ranging from heifers with first calf to the oldest cow in the barn aborted. The remaining nineteen did not abort. The fetuses ranged from five to eight months and were born dead and alive. When I was first consulted there were five, all with retained placentas in various stages of decomposition. One of the cows was down, unable to rise, and consequently was destroyed. One other, after removal of the placenta, developed a perimetritis. Due to the straining of the animal, the uterus was tipped up and backward between the floor of the rectum and the roof of the vagina, cutting off all escape of the retained liquids through the os uteri. The following week the uterus was found adhered to rectum and vagina. The cow was off feed and weak behind. A longitudinal incision through the roof of the vagina and through the uterus liberated a copious discharge of retained débris. She was then douched regularly with the rest of the herd and ultimately made a good recovery. She was not bred but sold for beef after the lactation period.

The treatment of this herd was as follows: The placenta was removed manually when ready, the uterus douched with hot normal salt solution and vigorously massaged per rectum. The whole bunch was treated regularly from four to seven days apart as long as any discharge was present or a small stomach tube could be inserted through the os. The cows were all kept on a one-half ounce dose of 1 per cent strychnin twice daily. These cows were not bred under three months following abortion. The bull was flushed out with ¼ per cent Lugol's solution before and after serving. This practice of douching is still carried out today. These fourteen cows all conceived and carried their calves full time, having apparently normal offspring with but one retained placenta. There was one aborter in the herd the second year and none last year. In tracing back the herd's sire we found that he came from a herd which was apparently saturated with infectious abortion. Several of these fetuses were sent to Dr. C. M. Carpenter, at Ithaca, N. Y., who found the Bang organism in all but one. All cows in this herd were sprayed with a 1 per cent creolin solution twice daily. The gutters were likewise treated.

Another herd had six out of twenty abort. These were treated the same except that bacterins were used. One aborted the following year.

In another herd three out of fourteen aborted. Same treat-

ment; vaccinated with live cultures. One aborted, three others the following year.

Last spring I had another herd in which six out of fourteen aborted. The first two were unattended and both died. The other four were treated and douched. These cattle were afflicted with a necrotic form of metritis and vaginitis. One heifer in particular had so much necrosis in the vagina that it was nearly impossible to pass my hand into the vagina. I was afraid it would perforate the walls of the vagina. Tampons of cotton saturated with Flavisol were packed into the vagina and left for several hours. Subsequent flushing of the vagina with the same solution, twice daily, seemed to control the infection. These four cows were bred and all conceived.

In another herd under treatment at the present time I have injected ten head, as fast as they freshened, with live cultures. This herd has been troubled with abortion for the last five years.

SCOTTISH VETERINARY SCHOLARSHIPS

The Board of Agriculture for Scotland has established scholarships for the sons and daughters of agricultural and other rural workers. Courses at the Edinburgh and Glasgow Veterinary Colleges are included. The scholarships are limited in cost to 360 pounds sterling for three years, or 120 pounds for any one year, with additional allowances for class fees and traveling expenses.

FRENCH VETERINARY DEGREES

A bill has been introduced in the French Parliament to create the degree of veterinary doctor to be conferred by the national veterinary schools at Alfort (near Paris), Lyons and Toulouse. Heretofore these schools have awarded only a diploma of "veterinarian" without the degree of doctor, and this has been an obstacle to the recruiting of students. Certain rules will determine the guaranties required for the conferring of the doctor's diploma and conditions under which it will be awarded to those who already have the veterinarian's diploma. The bill provides for a fine of from 500 to 10,000 francs for those who assume illegally the title of veterinary doctor, or who, without being a doctor of medicine, do not mention the title "veterinary" in connection with that of doctor.

ABSTRACTS

THE TREATMENT OF NERVOUS LOCALIZATIONS OF CANINE DISTEMPER WITH FORMINE (UROTROPIN). L. Panisset and J. Verge. Compt. Rend. Soc. Biol., vol. 87 (1922), no. 25, p. 411.

Urotropin may be administered to the domestic carnivora per os, subcutaneously or intravenously. It is broken up in the body into formaldehyde and ammonia, the former being found in the cerebrospinal fluid, the saliva and the bronchial secretion. It is probable that the powerful antitoxin and anti-infectious power of urotropin should be attributed to its decomposition into formaldehyde and ammonia. The authors utilized this marked bactericidal power in the treatment of certain nervous forms of distemper. Of 11 patients treated, 5 died in spite of intervention, 5 cases were cured, and 1 case is at present improving. The medication is more effective if used when first symptoms appear.

There is injected intravenously 1 to 2 grams of urotropin according to the size and weight of the dog. The drug is dissolved in either 5 or 10 cc. of normal salt solution. The injections are repeated each morning for 10 days. Improvement should occur after about the 5th or 6th injection. When a series of injections have produced no result, a similar series of injections should be undertaken after a rest of 10 days. Urotropin merits a trial in the treatment of other forms of distemper particularly the pulmonary or intestinal. The treatment should be instituted early in the disease. L. T. GILTNER.

PYOSEPTICEMIC INFECTIONS IN NEWBORN ANIMALS. L. C. Maguire. Vet. Jour., vol. 77 (1921), no. 555, pp. 334, 335. (Abst. in Exp. Sta. Rec., vol. 47, p. 286).

The author claims to have eradicated white scours from eight dairy farms having a total of 112 cows by treating the pregnant cows with a vaccine prepared from an affected animal on the same farm. The vaccination, which is carried out in the seventh and eighth month of pregnancy, consists of three injections at intervals of 10 days, the first injection containing 10,000,000, the second 25,000,000, and the third 50,000,000 dead bacilli. One

week after birth each calf receives an injection of one-fourth the initial dose of vaccine employed for the cows.

VACCINATION AGAINST BOVINE HEMORRHAGIC SEPTICEMIA WITH ATTENUATED VIRUS. F. D'Hérelle and G. Le Louet. Ann. Inst. Pasteur, vol. 35 (1921), no. 11, pp. 741-744. (Abst. in Expt. Sta. Rec., vol. 47, p. 285.)

Data are presented showing that the virus of bovine hemorrhagic septicemia attenuated by repeated passage through rabbits is capable of producing a lasting immunity in cattle or buffaloes. This virus can be preserved unchanged in macerated rabbit tissue, but if kept in macerated beef tissue it apparently regains its virulence so that fatal results are obtained following inoculation.

COWPOX AND SHEEP POX. J. Bridré and A. Donatien. Ann. Inst. Pasteur, vol. 35 (1921), no. 11 pp. 718-740.

The authors review the conflicting literature on the relationship between sheep pox and cowpox, and report a series of experiments undertaken to solve the question of the identity of these diseases. The conclusions drawn from the investigation are as follows:

Sheep can be inoculated with cowpox virus and can be used for the production of cowpox vaccine. Inoculation of vaccine (cowpox) protects sheep against a new inoculation of the vaccine provided the first inoculation has been followed by a satisfactory reaction. Vaccination against cowpox does not immunize sheep against sheep pox, nor does vaccination against sheep pox immunize sheep or other animals against cowpox. The results are thought to indicate that the virus of cowpox and sheep pox are not identical. Several references to the literature are appended.

NEW TREATMENT FOR THE NERVOUS FORM OF DISTEMPER IN DOGS. G. Lichlenstern. München. Tierärztl. Wchnschr., 1921, p. 779. (Abst. in Rev. Gén. Méd. Vét., Oct. 15, 1922, vol. 31, p. 603.)

The treatment of Lichlenstern is based on the fact that aged dogs do not contract distemper, which proves that the blood of of these dogs contains products (antibodies) which prevent the evolution of the disease.

In order to utilize the blood of aged dogs in the treatment of distemper Lichlenstern proceeds in the following manner: The aged dogs, brought for slaughter, are bled white, and there is added to the blood collected a sterile solution of sodium citrate in the proportion of 10 per cent. The dogs to be treated receive 100 to 500 grams of citrated blood, injected subcutaneously at the junction of the neck and shoulders.

According to the author the results are surprising. Dogs down with grave nervous symptoms are able to get up the second day after the injection, the gait becomes easy, and the improvement becomes so pronounced that after a few weeks the weakness of the hind quarters disappears completely.

PHENOL AND CRESOL AS PRESERVATIVES IN BIOLOGIC PRODUCTS. P. Masucci. Jour. Infect. Diseases, vol. 30 (1922), no. 4, pp. 379-387. (Abst. in Expt. Sta. Rec., vol. 47 (1922), p. 383.)

Contrary to the results reported by Krumwiede and Banzhaf, ether-cresol has been found to be slightly less rather than more germicidal than cresol alone and is considered to have no advantage over cresol alone as a preservative of serum. No marked difference was noted in the amount of the precipitate formed on standing between serums treated with cresol or ether-cresol.

THE VALUE OF COMPLEMENT-FIXATION AND AGGLUTINATION TESTS IN THE DIAGNOSIS OF GLANDERS. A Marcis and R. Manninger. Berlin. Tierärztl. Wchnschr., 36 (1920), no. 29, pp. 333-335. (Abst. in Expt. Sta. Rec. vol. 47 (1922), p. 385.)

The results are reported of serological tests and postmortem findings in 380 horses condemned as glandered. The data obtained were analyzed with respect to the following questions: (1) How often is the anatomical diagnosis of the slaughtered animals in agreement with the blood tests, and (2) how often in positive cases of glanders have the blood and eye tests failed?

In answer to the first question the data obtained show that of 296 cases in which the complement-fixation test gave positive results, 286 proved on autopsy to have glanders. With the agglutination test there were 246 positive results confirmed in 239 cases, while in the eye test there were 228 positive reactions confirmed in 213 cases. Of the 286 cases giving positive results on

autopsy, the eye test alone failed in 8 per cent, the agglutination test in 14, the complement fixation test in 12, the combination eye and agglutination test in 3, the agglutination and complement fixation test in 5, the eye and complement fixation test in 2, and the combination of three tests in 2 per cent.

"ROUGE" OF SALTED MEATS. ISOLATION OF THE SPECIFIC AGENT. Martel and R. Germain. Bul. Acad. Méd., Dec. 27, 1921. (Abst. in Rev. Gén. Méd. Vet., vol. 31 (1922), p. 415.)

In the sanitary inspection of salted meats for the French Army from the beginning of the war the authors noted an alteration termed "rouge" which affected all sorts of such products, but especially bacon and hams of American origin and codfish. The name "rouge" is given to it because of a sticky reddish coating on the product, ranging from pink to wine color, which in contact with water forms a sort of mucus.

Microscopic examination revealed numerous germs, several of which had already been described as agents of "rouge" by Mégnin and Le Dantec; but the authors observed that (1) the quantity of microbes in evidence does not correspond with the abundance of the red coating; (2) the germs in different preparations are often different; (3) there exists in all the preparations a base inclosing the germs and colored with safranin, the blues, thionin, etc.

Cultures on solid media saturated with salt permit the isolation of an agent which the authors consider specific and for which they propose the name *Micrococcus rubroviscosus*. On solid media (codfish gelose saturated with salt, potato saturated with salt, etc.) there appear, sometimes after one month, punctiform colonies, always transparent when they are pure, and which gradually take on a ruby red. In liquid media saturated with salt a fragile red film is formed, which becomes detached and falls to the bottom, to be replaced by another.

The examination by dark field illumination of the aqueous emulsion of a particle of culture reveals the presence of a fine coccobacillus, when examination by ordinary methods has shown nothing. The authors point out this peculiarity to explain the failure of other observers. The specific agent is masked by other microbes to which it adheres by reason of its tenuity and viscosity.

The specific microbe is aerobic; it falls in the class of chloridophiles of Le Dantec. On solid media its development is slow and often it does not appear for a month. It may be cultivated at 10° C.; the optimum temperature is 35° C. After a few months the red tint fades and turns yellow, as on codfish, which when decomposition sets in, takes a yellow tint.

The microbe was found on all the salted meats examined. This ubiquity is explained by the fact that in all the salts of commerce, except rock salt, the germ may be isolated. All salted meats are therefore subject to "rouge." Humidity, heat and lack of aeration are conditions favoring the development of the microbe.

The appearance of "rouge" on salted meat, facilitating by its coating the development of a multitude of germs, is like the first stage of putrefaction, and little by little the characters of "rouge" disappear and give way to a putrid softening. On fat bacon the alteration is benign, as the compactness of the tissue impedes the penetration of the agent; but on codfish, the flesh of which is friable, the "rouge" is very serious.

REVIEWS

OM OKSEBREMSENS BEKAEMPELSE (FIGHT AGAINST THE OX WARBLE). Dr. Laust Brodersen. Maanedsskrift for Dyrlaeger (Copenhagen), Vol. 34, Pt. 13, Oct., 1922.

The facility with which the ox warbles (*Hypoderma* spp.) can be greatly reduced in numbers is mentioned by the author. The situation of Denmark is favorable to entire eradication of this pest in that country provided a concerted fight should be made against it. The Minister of Agriculture proposed a law last winter looking toward the eradication of the pest throughout the country. While this proposal was received favorably by the law-making body it was deemed desirable not to press its passage at that session owing to the danger of the spread of foot-and-mouth disease by those carrying on the work.

After discussing the various methods of destroying the ox warble and pointing out their difficulties and objections the author stresses the advantages of an instrument for mechanically removing the larvae or grubs, which he and an engineer of Copenhagen have perfected.

The instrument consists of a brass pump about the size of a small garden hand sprayer. This is arranged with piston and valves calculated to create a partial vacuum. The lower end of the pump is provided with a suction bell of rubber which is applied to the animal over the warble hole. As this is firmly pressed against the warble the handle of the pump is pulled out and the combined pressure and suction removes the larvæ as well as the pus which surrounds it. He states that in some instances the larvae come out with a single stroke of the pump while in other cases several strokes are necessary.

Before beginning extraction the hide on the back of the animal is rubbed with soapy water to facilitate extraction.

The author states that he has tested this device in extracting about two hundred and twenty larvae from thirty-five animals in different localities. Most of those extracted were in the later stages of development but the author believes that the younger ones could be removed in the same way.

The writer of this review is of the opinion that Dr. Brodersen has made a notable contribution to this field of work in devising this mechanical warble extractor. It is, of course, desirable that the instrument be tried out on a very large scale, especially with different breeds of cattle, some of which are known to have characters of hide which make grub extraction very difficult. If the instrument works successfully under all conditions it would commend itself on account of the greater cleanliness of the work, lessening the chances of bruising the tissue and possibly producing less pain to the animal, as well as its ability to remove the pus from the cysts. F. C. B.

CARRIERS IN INFECTIOUS DISEASES. Henry J. Nichols, M. D., M. A., Major, Medical Corps, U. S. Army, with a Section on Carriers in Veterinary Medicine by R. A. Kelser, D. V. M., M. A., Captain, Veterinary Corps, U. S. Army. Published by Williams and Wilkins Company, Baltimore, Md.

Major Nichols is a member of the Medical Corps, U. S. Army, stationed at the Army Medical School, Washington, D. C., where for several years he has been an instructor in bacteriology, parasitology, and preventive medicine.

Captain Kelser was employed in the laboratories of the Bureau of Animal Industry for over seven years before he resigned to

enter the Army, and he is now director of the Veterinary Laboratories of the Army Medical School, Washington, D. C. Both writers are well known to the members of their respective professions.

This new and interesting work on a very attractive subject consists of 184 pages, including the index, and 11 illustrations, and is divided into four parts as follows:

Part I. General Considerations.—Deals with pathology, diagnosis, treatment, and the importance of the subject of carriers.

Part II. Special Diseases.—Carriers in typhoid fever, cholera, dysenteries, diphtheria, respiratory infections, blood disorders, and sexual diseases are discussed under this heading.

Part III. Summary.—The place of carrier work and the method of conducting it are dicussed in connection with the relations of phorolgy to preventive medicine.

Part IV. Carriers in Veterinary Medicine.—This part of the work is of special interest to veterinarians. The subject is treated under four headings as follows:

1. Carriers of organisms pathogenic for both man and the lower animals. The list includes such bacteria as *Micrococcus melitensis,* various bacilli such as *tetani, anthracis, mallei, diphtheriæ, erysipelatis suis,* and the filterable virus of foot-and-mouth disease.

2. Carriers of organisms pathogenic for animals and possibly for man.—*Bacterium abortus,* streptococcus of infectious mastitis of cattle, and the trypanosomes appear in the list discussed.

3. Carriers of organisms pathogenic for lower animals only. The bacilli *bipolaris septicus, necrophorus, paratuberculosis;* also various protozoa and the filterable viruses are covered under this heading.

4. Conclusion.—Comparisons are made between human and lower animal carriers and the notable features of the subject in veterinary medicine receive attention.

The recognition of the infectious nature of certain diseases marked the beginning of a new era in the theory and practice of medicine, and the observations by Kock in 1892-93 that apparently healthy animals might disseminate the virus of hog cholera led to rapid progress in the explanation and prevention of infections, but comparatively little has been published on this as a distinct subject. Previous to the publication of the work by Major Nichols and Captain Kelser we had in English two monographs on the subject of carriers—"The Carrier Problem in

the Infectious Diseases," by Ledingham and Arkwright, and "Human Infection Carriers," by Simon.

In view of the recognition of the importance of "Carriers" in our fight against disease and the able manner in which the subject is handled by the authors, "Carriers in Infectious Diseases" commends itself to students and to practitioners of both human and veterinary medicine as a reliable, up-to-date work on this important subject.

HOG CHOLERA, ITS NATURE AND CONTROL. Raymond R. Birch, B. S., V. M. D., Ph. D., Professor in Charge of the New York State Veterinary College Experiment Station at Cornell University, Ithaca, New York. Published by the Macmillan Company, New York, N. Y.

The author is well known to the members of the veterinary profession through the research work he has done and his participation in the activities of National and State veterinary medical organizations.

This work, consisting of 311 pages, including 20 illustrations, is divided in 11 chapters, as follows:

History and Economic Importance
Nature and Cause of Hog Cholera
Methods of Dissemination
Complications
Symptoms and Lesions
Diagnosis, Differential Diagnosis, Prognosis
Preparation of Anti-hog-cholera Serum
Methods of Using Anti-hog-cholera Serum
Handling Hog Cholera in the Field
Hog Cholera, Meat Inspection and Garbage Feeding
Control and Eradictation of Hog Cholera

The book presents a pleasing appearance; it is neatly bound, the paper is of good quality and the print is clear. Dr. Birch's work is deserving of a welcome reception, especially at this time when veterinary practitioners are looking for up-to-date information on the differential diagnosis of swine diseases.

U. G. H.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the December* JOURNAL.)

THURSDAY EVENING, AUGUST 31, 1922

The meeting convened at 8:10 p. m., President Kinsley presiding.

PRESIDENT KINSLEY: First we have a report from the Executive Board.

REPORT OF EXECUTIVE BOARD

SECRETARY MAYO: Before I make that report I wish to make an explanation. Some evidently have not understood the registration fee of a dollar that was charged here. At the meeting in Columbus two years ago the Association voted to charge a dollar registration fee, to be used for entertainment. The registration fee collected here has been turned over to me and is to be used in defraying the expenses of the clinic only. I wanted you to understand that.

I have a telegram from Dr. Dalrymple, in response to one that was authorized to be sent. "Greetings received with sincere appreciation. Hope meeting unqualified success."

The following applications for membership have been favorably recommended by the Executive Board:

Hugh F. J. Arundel, Blackshear, Ga.
F. O. Whiteman, Carrollton, Ill.
T. E. Norman, Jasper, Ind.
John D. Lyle, Sparta, Ill.
C. W. King, Trenton, Ohio.
W. E. Martin, Perry, Mo.
M. E. Gouge, Sedalia, Mo.
William Tennant, Toronto, Ontario, Canada.
J. J. Hoffman, Cincinnati, Ohio.
C. R. Walter, Tulsa, Okla.

PRESIDENT KINSLEY: What will you do with this list of applications?

DR. CONNAWAY: I move their election.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Board recommends that Section 1, Article 17, of the Constitution and By-Laws be so

amended that the Committee on Intelligence and Education shall consist of two teachers of veterinary science, one veterinarian in Federal or Dominion regulatory service, one veterinary military officer and one practitioner.

The Board also recommends that Section 1, Article 5, of the Constitution and By-Laws be so amended as to permit the Executive Board to remit individual dues under special circumstances.

Those recommendations will have to lay on the table a year.

The Executive Board recommends that the report of the Committee on Veterinary Anatomical Nomenclature be adopted and the committee discharged.

PRESIDENT KINSLEY: What will you do with this recommendation?

DR. NEWSOM: I move that it be adopted.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Board recommends that the Committee on International Veterinary Congress be discharged

DR. MILLER: I move that the recommendation be adopted.

(The motion was seconded and carried.)

SECRETARY MAYO: It is recommended that as soon as the funds in the hands of the Salmon Memorial Committee be turned over to the Treasurer the committee be discharged.

PRESIDENT KINSLEY: You have heard the recommendation. What is your pleasure?

DR. KELLY: I move it be approved.

(The motion was seconded and carried.)

SECRETARY MAYO: It is recommended that the report of the Liautard Memorial Committee be adopted and the committee discharged.

DR. MILLER: I move the adoption of the recommendation.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Committee also recommends that the Committee on Revision of National Formulary be discharged.

DR. SIMMS: I move the recommendation be adopted.

(The motion was seconded and carried.)

COMBINING OFFICES OF SECRETARY, EDITOR AND BUSINESS MANAGER

PRESIDENT KINSLEY: Dr. Way, chairman of the Executive Board, has some further report.

DR. WAY: The Executive Board respectfully submits the following:

At Philadelphia, in 1918, an amendment to the Constitution and By-Laws was presented by Dr. Mayo, providing for the amalgamation

of the offices of Secretary, Business Manager and Editor of the official JOURNAL of the Association, the incumbent of this office to devote his entire time to the affairs of the Association.

A subcommittee of three from the Executive Board was appointed to study the situation and make recommendations to that Board. For two years the committee has carefully studied the situation in an endeavor to make recommendations for the best solution of this question.

Approximately fifty members have been consulted, more especially in reference to their availability to accept the position, and many more have been consulted for advice and suggestions.

At the opening session of the Executive Board at this meeting Dr. Mayo notified the Board that he wished to be relieved of the duties of Secretary as soon as the change could be conveniently made without embarrassment to the Association. Dr. Mayo has worked faithfully and diligently, and at all times has been ready to undertake any task that has been desired by the Board. His records are most accurate, his files are most complete. The affairs of his office have been audited by an expert accountant and found to be in every way accurate and above criticism.

Dr. Mohler, as Editor of the JOURNAL, and Dr. Mayo, as Secretary of the Association, have been consulted, and the situation has been discussed from every possible angle, from a business, financial and policy standpoint, in reference to the advisability of the amalgamation of these two offices at this time. Both of these efficient officers have advised that they feel the step is a wise one, and that they are willing to assist in every way possible in the amalgamation and serve to the best of their ability in consummating the arrangement.

The Board has considered both the present Editor and the Secretary as admirable men for this combined position; in each case the proposition has been declined with thanks and appreciation for the compliment, but for personal reasons it is impossible for either to accept.

The Board wishes to take this opportunity to commend Dr. Mohler as Editor of the JOURNAL for the efficient and satisfactory administration of his duties in connection with the official organ of the Association. The business management is efficient, the records are complete and clear, and an official audit shows his accounts to be correct and in every way above criticism.

In casting about for a suitable man for this position, one possessing all the desirable attributes is difficult to find. Men holding responsible positions receiving, in many cases, higher salaries than it is deemed advisable by the Executive Board for this Association to pay, and working under surroundings that are congenial, can not see their way clear to accept the position.

In the final analysis of the question, the Board has selected and recommends from the men most available Dr. H. Preston Hoskins, of Detroit, Mich., for the position of Secretary-Editor of this Association. He did not seek the position, and by virtue of his training and ability we believe he will be able to serve the Association in an efficient and satisfactory manner. We recommend that the complete amalgamation of the two offices be effected not later than January 1, 1923. Both the present Editor and Secretary have assured us of their full cooperation in consummating this arrangement.

The Board recommends that the position of Secretary-Editor carry a salary of $4,000 for the first year, and providing the services are satisfactory to the Board, that the salary be increased to $5,000 at

the beginning of the second year, future advancement in this respect to be governed entirely by results obtained.

It would seem advisable after three years of careful consideration that the plan as suggested would be to the benefit of the Association. We make these recommendations for your careful consideration, and trust that you may see fit to approve the action of your Executive Board.

DR. WAY: I move the adoption of the recommendation.

(The motion was seconded.)

DR. TORRANCE: I would like to interpolate a question at this stage, because I may be perhaps a little ignorant of the situation. I have noticed that the report of the committee extols in no measured terms the efficiency of our present officers, the Secretary and the Editor, and I feel quite confident that their opinion of these two officers is well merited and is shared by a large number of the members here. But, sir, when prosperity is smiling upon an organization, when everything is running along smoothly, when you are perfectly satisfied with your officers, is that the proper time to make a change, a radical change, in both officers at the same time, taking away the men who have shown by their experience and by their work that they are well fitted for that work, and putting it in the hands of no matter how well-selected a man, but a man who is not conversant with the work and has had comparatively little experience?

I would like to ask, therefore, whether any effort has been made to induce Dr. Mohler to remain as Editor of the JOURNAL for a further period. I feel strongly, gentlemen, that John Mohler's name on the face of that JOURNAL is something like the "U. S. inspected and passed" mark upon a piece of meat. You know the quality is there, and I for one would be very reluctant, if it is at all possible to retain Dr. Mohler's services, to have them parted at the present time. If by any possible way we can retain the services of Dr. Mohler, I think we should, for the benefit of the Association, endeavor to do so; and I would like to have some assurance from the committee that an effort has been made to retain those services.

DR. SHORE: I rise to try to express in some way a second to what Dr. Torrance has just said. I can recall, it seems to me, when the JOURNAL was not as readable a magazine as it is now. Can't we do something to continue this present course that the JOURNAL has taken? Isn't there some way that we can ask the Executive Board to reconsider this action, and if possible get Dr. Mohler to remain in charge of the JOURNAL for some future period?

DR. EAGLE: I can not see, from a financial standpoint, how they expect to better the condition of the Association by removing both of these gentlemen at this time, or doing away with the two offices and amalgamating them into one, if you are going

to pay $4,000 the first year and at the end of that time $5,000 a year, or the combined salary that I understand the two men are getting now.

Anyone who had any experience or paid any attention to the JOURNAL previous to the New Orleans meeting knows what that JOURNAL was. I don't know who the Editor was. I make no reflections on him, whoever he was. But we know we did not get the JOURNAL regularly. Furthermore, if we will take the report as submitted by Dr. Mohler and approved by this body of men, we will note the increase in profit in this JOURNAL in the last year. I am frank to tell you that as commercial men we feel more like putting our ads in this JOURNAL with Dr. Mohler at the head of it than we ever have before—I don't say better than we ever will, but we will feel better with Dr. Mohler as Editor of that JOURNAL. I can not see why at this time it would benefit this Association to amalgamate these offices.

DR. A. E. CAMERON: May I ask if the decision of the Executive Board was unanimous?

PRESIDENT KINSLEY: That is a pertinent question. I don't know whether it is answerable or not. I will leave that to the Executive Board.

DR. TORRANCE: We have had no reply from the committee in regard to this question that I asked, and before the question of adopting their report is put to the meeting, I think they should be given an opportunity.

PRESIDENT KINSLEY: I thought it would be well for anyone who wanted to discuss the report to discuss it first. If there is nothing further we will ask Dr. Way to answer the questions that have been asked.

DR. WAY: As for the question of the management of the offices of the JOURNAL and of the Secretary, the Executive Board I think clearly expressed in their report the attitude of that body toward the present incumbents of these offices.

In Philadelphia an amendment to the Constitution and By-Laws was presented to amalgamate these two offices. At Columbus the amendment was adopted. The Association signified to the Executive Board, by amendment to the Constitution and By-Laws, that it wished to combine the two offices.

With reference to Dr. Torrance's question, we of the Board very much desired that Dr. Mohler accept the combined position.

In reference to the unanimity of the Executive Board, the report as submitted has been approved by all the members.

I don't know that there is anything more I can say. We simply interpret your instructions, or the instructions of the Association, in a desire that the two offices be amalgamated, and we submit our report.

DR. WHITE: There seems to be a struggle here between a very beautiful sentiment and a hard-headed business. I have been a member of this Association over a quarter of a century. I have admired its sentimentality but I have often doubted its wisdom in a business way. The majority of the membership undoubtedly must have had this feeling some three years ago when this change was proposed. The change was to professionalize the offices of Secretary and Editor so that we might have a continuous administration. This went even further; it was hoped to include a permanent home for the Association. Your Executive Board was requested to make a study of this matter and report. A report is now before us. We have been procrastinating in this matter for about three years, and we are not getting anywhere. In the meantime, our Association is hardly holding its own in membership. Our funds are not increasing. Here a small handful of us represent what is probably the largest veterinary association in the world. If we wish to become a power in veterinary policies and politics in North America, I feel that we must sweep aside any sentiment we may have in the matter and get down to good, hard-headed, practical business. One of the first steps in this direction, in my opinion, is the establishment of a permanent secretaryship, and personally I feel that before we get where we wish to get we will have a permanent meeting place.

In the State of Ohio our State Association has a much larger turnout than does our National Association.

Dr. Mohler is one of my best friends. If I thought for a moment it would be possible for him to accept this permanent secretaryship, I certainly would vote in his favor. He has been asked but obviously he has had to decline it.

When I was President of the Association I found Dr. Mayo one of the most efficient, pleasant, honorable and upright gentlemen I ever have had the pleasure of dealing with. He also is unable to accept the position. In the neighborhood of fifty members of the Association have been approached, but for reasons given they can not accept. As what might be termed perhaps, therefore, a compromise candidate, Dr. Hoskins has been suggested. In the light of these things I trust that the report of the Board will be adopted, because I feel that it will be for the best interests of this Association, and make a greater power in framing veterinary policies and in controlling veterinary politics in North America.

If we continue on in this way, in my opinion in five years we shall be no more powerful than we are today. An association can not stand still; it must either go forward or go backward. Tonight you gentlemen are to decide whether to proceed or retrogress. In my humble opinion, to sustain the report of

this Board will be to progress. I, therefore, shall vote for the motion.

DR. FITCH: I happened to be present at this Association meeting when the motion was originally placed before it to combine these two offices. There was considerable debate before the Association at that time as to the wisdom of that policy. After some debate it was unanimously adopted that such a policy was a wise one for this Association to take. It has not been an easy thing to find a man who could and would fill this position. I might say that I was one of the men who was approached as to availability, but it is a position which entails trust and work and responsibility, and one does not always feel that he can leave a position in which he has partially succeeded to take one which is possessed of more or less doubt.

This Association in the election of a combined Secretary or a permanent Secretary and Editor is following the lead of associations in other lines. It is following a policy which not only has proven its worth, but is one in which this Association can have a great deal of benefit, and it would seem to me that after four years' consideration—one year in the consideration of the amendment and its adoption and three years in the selection of a man—it would be a step backward if this motion did not prevail.

DR. UDALL: The question upon which you have been called to pass is one that involves far more than the personality of any individual or the temporary success of any journal. It is a bottom-stone of the principle and of the policy for which this Association intends to stand. I believe I am correct in the statement that our profession, as large as it is, is a service incidental to the livestock industry of this country. We are made up of various groups—practitioners, representatives of commercial houses, teachers, investigators and regulatory men. The administrative office of this Association should be free from the entanglements of any single group. The administrative office of this Association and the policies and the principles that are best for the livestock industry and for the Association as a whole are of infinitely greater importance than the selection of any particular individual or the publication of any journal.

Issues of tremendous importance to this industry and to this profession are immediately ahead of us. These are issues that are not peculiar to this profession; they have been before the medical profession for a considerable time. Briefly stated, the one of chief importance at the present is the correlation of state service for the control of disease. There appears to be antagonism between these two groups, complaints arise from stock owners, from practitioners, from individuals of each group of our profession. The proper correlation and the proper under-

standing of the questions that underlie this issue are ones that must be settled for the good of all concerned.

We stand here representing to a considerable extent the leadership of the profession. At home many of our colleagues will ask, as they have asked, "What does the profession mean to me? What does the National Veterinary Medical Association mean to me?"

We have had an excellent clinic for the practitioner; his interests have been carefully looked after; there has been recognition of the fact that this body of men, constituting about 85 per cent of our members and the élite of the profession, should be properly recognized; but we have got to do more for these men than merely to provide source of instruction and entertainment. They want to know where we stand upon the principles that affect their service. I want to know whether I can say to my clients, whether in the advice that I am giving in serving, in my service as a private individual, I am supported in this advice by my national organization.

We representatives of livestock organizations stand for a policy that seems to be wise both for their interests and for our interests. I would like to feel that my colleagues in regulatory work, in institutional work, and in all the different branches of profession take me equally with assurance. That is the issue before us, and in voting upon the adoption of this recommendation you are expressing to the mass of men who constitute our profession the indication as to which way you lean, whether in this issue of correlation of state medicine and of private enterprise you are leaning to domination by state medicine or whether you are willing to set up a policy in which your representative is controlled by all of the various elements of the organization and to which all can come with equal opportunity and fight the battle if it is necessary.

DR. CONNAWAY: I wonder if we haven't had enough oratory on this? Even if the water is a little cold, let us try it. I think we will make no mistake. This young man is young because it isn't his fault. In time he will outgrow that. It is no fault of his that he is young; I am glad he is young; but he has had experience. I think we ought to vote on this very promptly.

DR. TORRANCE: I do not wish to delay the decision on this matter, but I feel that I have a duty to perform in asking for a definite reply to the question which I addressed to the committee; that was whether Dr. John R. Mohler had been approached with a request to continue the editorship of the JOURNAL for a still longer period. The reply which I received was that he had been offered the position of dual importance, the position combining the secretaryship and the editorship. That was not what I asked. I don't know that it is absolutely

necessary for these two positions to be combined at the present time, and I feel strongly that it is in the interest of the Association, even if it is necessary to postpone for another year the amalgamation of these offices, that we should endeavor to retain the services of Dr. John R. Mohler as Editor of this JOURNAL.

It is not necessary from a business point of view at the present time to make this change, because the JOURNAL has been progressing. Everybody admits that it is more prosperous in a commercial way, more influential in a literary way, than ever before. The Editor is a man of culture, who understands foreign languages, who is able to read foreign literature, and now we propose to let him out and put a man who has had comparatively little experience in journalism, and to combine with that the office of Secretary.

I believe in progress. I have been a member of this Association a long time. I have its interest as much at heart as my friend Dr. White, who recently spoke. I fully believe that before you take a step you should see that you are going in the right direction. Now, I doubt very much whether this is a step in the right direction with regard to John R. Mohler, and I would, therefore, move that this recommendation of the Executive Board be referred back to them with the object of ascertaining whether it is possible to employ the service of John R. Mohler for a longer period.

(The motion was seconded.)

DR. WAY: I rise to a point of order. There is a motion before the house.

I am sorry that I didn't answer Dr. Torrance's question in a way that he desires. I will endeavor to do so now.

Dr. Mohler told the Executive Board that he would be glad to assume the responsibility of the JOURNAL for another year, or that he would be glad to relinquish the editorship of the JOURNAL at this time. We all felt (I speak for the members of the Board as a whole, I think) that it would be better to effect this amalgamation by extending it over a longer period of time, but for reasons that were presented to the Executive Board, it was finally decided that the amalgamation should take place in four months, or by January 1.

I think that states the position or the question as it has been discussed with the Editor and with the Secretary by the members of the Board.

The point that the Board wished to bring out is this: That this Association has by amendment to its Constitution and By-Laws instructed the Executive Board to effect this amalgamation. If the Association didn't want the Board to effect this amalgamation, why did it give the instruction? We are acting as a part of this Association; the Executive Board is sort of a clear-

ing house, and we submit to the best of our ability the results of the deliberations of the Executive Board on a question regarding which you have given very definite and decided instruction. We trust that the motion may prevail.

PRESIDENT KINSLEY: State your point of order.

DR. WAY: There is a motion before the house.

PRESIDENT KINSLEY: This motion to refer back takes precedence.

DR. WAY: I accept your ruling.

DR. BUTLER: It seems to me that Dr. Way has taken rather a peculiar view of this matter. There is no assumption, so far as I can see, that the Association doesn't still want the offices amalgamated; but may I not ask that there may be some question of the wisdom of the way that they are amalgamating? If they had separated the report so that the Association could vote upon these two problems separately, there wouldn't be any question in my mind but what they would still vote to amalgamate the offices. But I can see that there might be a very great difference of opinion as to whether you were wisely amalgamating them or not; whether it was wise to amalgamate at all at this time if you had to take a young man, however brilliant, however honest, however capable in so far as experience would permit, a man certainly not having had such a broad experience to be in touch with the various departments of the profession as outlined by Dr. Udall, a man who has not yet had that growth and development to fit an office of this size—the biggest office in the veterinary profession in America today, the office for which you should pick out a man of mature years, of broad, mature experiences, and a man of known and tested executive ability and known and tested ability to handle a proposition of this sort. If it is necessary to pay $5,000 or $6,000 or $7,000 a year to get that sort of a man, it is infinitely better as a business proposition to go out and find a man you want, the man who is suited, and then get him, and a thousand dollars in salary should never stand in the way.

Personally, I believe in the amalgamation of the offices; but I say with all due respect to Dr. Hoskins—I have it from every hand that he is brilliant, that he is honest, that so far as his experience goes he is extremely capable—that Dr. Hoskins has not had that broad experience, has not attained that age and experience which are necessary for such an office as this. That is the only reason that I am going to vote against this amalgamation.

DR. WHITE: I would be perfectly willing to pay our Secretary $15,000 a year. I wanted a Packard, but I got a Ford. I had only $328. The income of this Association is not unlimited. If it were possible to pay a permanent Secretary a decent salary

and at the same time retain Dr. Mohler as the Editor, I would be more than pleased to vote for that proposition; but I am assured that the income of the Association at the present time would not permit of this extravagance. This, of course, is a compromise proposition. I have no objection to paying whatever you want to if you have got the money.

DR. EAGLE: It looks to me like an association with $30,000 in the treasury could afford to buy a Packard in preference to a Ford. Now the increase last year, as I understand it, in the receipts from this JOURNAL alone was $5,900 increased profit, and it does appear to me that they could afford to pay a much better salary than they are offering under the present conditions. I think this Association with $30,000 in the treasury is in a pretty prosperous condition.

DR. KELLY: I personally think it is a serious thing to exchange two experienced men for one inexperienced man. Now, I don't mean any reflection on Dr. Hoskins personally, but if we can not at the present time get a person in a business way to manage it for the present salary which is offered, I think it is well enough to defer it. No business corporation or any other firm would take an inexperienced manager to fill the two most important offices in its corporation. I think it is inadvisable to make the change at the present time.

DR. LYNCH: I hope that you gentlemen will pardon me for speaking on this subject, being only a member of your Association at this meeting. I am a young man and a practitioner. I want to tell you gentlemen that I favor this amalgamation, and I favor a paid Secretary who is going to devote his entire time to this work. A great many of the practitioners throughout this country are absolutely dissatisfied with this Association, and there is nothing in the world that will bring those men to a realization that this Association is the one big need of their lives like having a man who is paid, who can go out into their associations, into their home States and carry the message and tell those men who are unable to come here what this Association is doing and show those men that this Association is really functioning and wants to function for that great mass of practitioners who today feel that this organization is not organized for them.

I take exception to the gentleman who said that he questioned the man whom the Executive Board had recommended for this office. I don't know the man, but I always have objected to the fact that anybody will say that a man has to grow a beard before he is able to run an organization. Throughout the breadth and length of this great country the young manhood of America is coming to its own. As I sat there and listened to a man say that because he isn't gray-headed he can not be a successful secretary, I felt that if the Executive Board,

which is made up of competent men, has seen fit to choose him, he is good enough for me.

DR. BUTLER: I didn't get up to make a reply to the whisker part; I have too much sense to answer that sort of an argument; but I wanted to answer Dr. White. Any business organization would not put a young man in there to manage it completely. I didn't mean that because he was young. I know there are men 25 years old that have a good deal more sense than Dr. Kinsley or myself, even if we grow chin beards; but any man who is going to manage as important a proposition as this has got to have experience, I don't care whether he is 25 or whether he is 50 years old, if he has had the right kind of experience; but he can't get it at 25. That is what I meant. I didn't mean any reflection on Dr. Hoskins. I didn't mean any reflection on boys, because I know a lot of 25-year-old boys that will know a good deal more than 60-year-old men. I would never hope, even if I grew a much longer beard, to have as much sense as he has; but it takes something more than sense—it takes experience and development in the work that he is going to manage, if he is going to manage as big a proposition as this.

DR. HART: This is a very serious proposition that has come up all of a sudden before an association which has been running along very smoothly for the last several years. I am not fully acquainted with all things that have transpired, but from what I see there are two questions that are bringing up this discussion. One is the experience of the man that is going to take the place, and the other is the moving of the time of making the transfer from July 1, 1923, to January 1, 1923.

There is a motion before the house to refer this back to the Executive Board. I feel satisfied that if this goes back to the Executive Board and they come back with a recommendation that this change be made to take effect July 1, 1923, there will be a unanimous agreement on it, and it seems to me that the importance of that unanimous agreement is greater than whether we delay six months longer or not. I have perfect confidence in the experience and in the ability of Dr. Hoskins to carry out this work. I believe that all we need to do is refer this back to the Executive Board to have the change made July 1, 1923, and it will be a unanimous agreement.

PRESIDENT KINSLEY: The question before the house at the present time is to refer this back to the Executive Board and have them ascertain and report whether or not Dr. Mohler will accept the editorship for one year.

(A rising vote was called for. Fifty-four voted for the motion and 60 against it. The motion was lost.)

PRESIDENT KINSLEY: If there are no further remarks we will vote on the original question.

(The motion was carried.)

DR. HOSKINS: Take a look at your Ford, gentlemen. I can't say that it has been extremely pleasant to listen to the debate during the past half hour or so. I should like to have been somewhere else.

As the Chairman of the Executive Board said, I did not seek this office. They came to me, and it was with considerable hesitation that I finally consented to allow my name to be considered. It was not that I doubted my ability to conduct this office. I am a young man, I will confess. I have had some little experience. I wouldn't like to have to enumerate the various secretaryships that I have held, but I might say incidentally that I have been doing editorial work for nine or ten years.

The prospects of assuming this office which the Association has been kind enough to bestow upon me makes me feel very much as I did just before I was going to be married. I looked forward to the event with keen anticipation and pleasure. I also felt fully conscious that I was undertaking a big jump.

I am not going to tell you what I am going to do with these offices. It is hardly within the province of the Secretary to say what the policy of the Association will be, but I give you my solemn pledge that I will put my entire heart and soul into the work, and that if necessary I will devote 365 days of the year to carrying on the work.

I doubt if there is a man in the audience who does not agree with practically every remark that was made this evening about conditions generally. Dr. Lynch, I believe it was, said he didn't know me, and I don't think I ever met Dr. Lynch, but he spoke of the practitioner. I have also been a practitioner; not very long, I admit, but having been raised in a veterinary atmosphere, I am fully aware of what the man in active practice has to contend with. My close association with the practitioners of Michigan during the past six years has kept me in very close touch with their situation, their conditions. I believe I know just about how they feel, and when I say that the feeling is quite general that the American Veterinary Medical Association has not done everything that it could for the private practitioner, I doubt if anyone will contradict me. The main reason for that, as I see it, has been because the Association has been slow in taking the step that it has taken this evening. They have had the right idea, they have diagnosed the case, and the only reason why more has not been done and a better feeling, a more confident feeling among the practitioners brought about, has been because the Association has not provided the means for doing

just that thing, and that was undoubtedly the fundamental idea in making provisions for somebody to devote his entire time to this office.

As long as the veterinary science is the diversified profession that it is, just so long as we have veterinarians engaged in such a great variety of work, just so long is this Association going to be made up of these different groups. We should lose sight of the fact that we are practitioners or that we are educators, teachers, or sanitary control men. As Dr. Cotton says, we are veterinarians, and as veterinarians we should look after our own welfare. Just so long as we have any feeling that one group of men is dominating the Association, that Association is not going to enjoy a healthy existence. So the only thing to do is for everybody to get together and pull together, and I don't doubt but what it will be a very short time before this condition which has been referred to among the rank and file of the practitioners will have disappeared.

I am not going to tell you men that I need your help, because you know it. I am not going to ask you men to give me your help, because I know that it is not necessary; I know that you will give it. If you didn't get the import of the Executive Board's report I am here to tell you that I am taking this position on probation, subject to giving satisfaction.

ADDRESS BY HON. CLARENCE OUSLEY

PRESIDENT KINSLEY: We have delayed our literary program considerably. I want to assure you that the rest of the evening will be more pleasant and more interesting than that that has gone before.

The first speaker on our program this evening is a man of national and international reputation. He is a gentleman who has no second in the knowledge concerning agriculture, and particularly does he know the relationships of the veterinarian and the agriculturalist. This gentleman was Assistant Secretary of Agriculture during the period of the war. He was formerly director of the Extension Division of the A. and M. College in Texas. He is an agricultural economist. I am pleased to introduce to you the Honorable Clarence Ousley, of Fort Worth, Texas.

(Colonel Ousley delivered his address, which was published in the JOURNAL for October, 1922, page 13.)

DR. QUITMAN: There is no doubt that we have listened tonight to the treat of the convention, to a most wonderful, broad, comprehensive address by the Honorable Clarence Ousley. I am first going to make a recommendation, and follow it up with a motion.

I do not think that if we appointed a dozen men to draft a

propaganda article we could better the address given by the Honorable C. Ousley. I therefore suggest as one of the duties of the new Secretary-Editor that we have at least 5,000 copies of this address printed and a copy sent to every member of this Association, coupled with the suggestion that he have it published in his local paper or papers, and if the opportunity presents itself, that he read it before the local agricultural or farmers' associations. I make that suggestion, and if a motion is necessary I will follow it up with a motion. While I am on my feet I want to move a rising vote of thanks of this Association to the Honorable C. Ousley for his most splendid address.

(The motion was seconded and carried by a rising vote.)

DR. QUITMAN: I move that the Secretary be instructed to have printed at least 5,000 copies of this address and that a copy of it be sent to each member of this Association with the suggestion that he endeavor to have it published in his local newspapers or farmers' publications if possible, and that he also endeavor to read it before the local farmers' or agricultural associations.

SECRETARY MAYO: This, of course, will be published in the JOURNAL, and I think it should be referred to the Executive Board. I therefore move it be referred to the Executive Board for full consideration as to the best way of distributing this splendid address.

(The motion was seconded.)

PRESIDENT KINSLEY: It has been moved and seconded that the matter relating to Mr. Ousley's address be referred to the Executive Board.

DR. QUITMAN: I think that that just means a delay. This is a question I think that is very clear to us all. The Honorable C. Ousley showed a comprehensive knowledge of our problems, just as good and just as well as we understand them ourselves, and he has pointed out the ways and means of combating the problems that confront the profession. To refer it to the Executive Board I think just means a loss of time. I believe that this Association has a right to formulate some plans of its own regardless of the Executive Board.

If it is published in the JOURNAL many of the veterinarians who are not present at this meeting will delay reading their JOURNAL. This iron should be struck while it is hot. I believe that if it is sent to them separately, it will attract the attention of the veterinarians. You must remember that there are about 4,000 of our members who are not present at this meeting, and we want to reach them by the direct method. While I approve most heartily of it being published in the JOURNAL, still I maintain that the direct way is the best.

DR. FITCH: Personally I would like to have some extra

copies of this address. It is not an easy thing to send a JOURNAL to various members of staffs and other organizations to whom I would like to send this.

DR. MERILLAT: I am rather inclined to believe that Dr. Quitman's motion is out of order, because the Constitution provides that all matters of publication shall be considered by the Executive Board. It is out of order because it is unnecessary.

DR. QUITMAN: I will amend my motion with the consent of my second. I believe that Dr. Merillat has the right idea about the Constitution and By-Laws. I will amend my motion to read that the Executive Board be instructed to have printed at least 5,000 copies. If they see fit, make it 10,000 copies. Like Dr. Fitch, I would like to have a number of extra copies myself, and I believe that our members will be writing for extra copies.

(Accepted by the seconder.)

PRESIDENT KINSLEY: With your permission I will declare the motion referring this to the Executive Board out of order and accept Dr. Quitman's motion.

DR. WAY: I am very sorry that the Executive Board has gained the reputation of being very inactive. There will be a meeting of the Executive Board before 12 o'clock, and I trust that before the midnight hour the address will be well on its way toward publication.

(The motion was put and carried.)

HON. CLARENCE OUSLEY: Will you allow me to say a personal word to express my very deep appreciation of your kindly acceptance of my remarks? If I have voiced the ethics and the concept of this Veterinary Medical Association, I owe it to the fact that for three years, as Director of Extension, I sat at the feet of Dr. Mark Francis, and for two years at Washington, as Assistant Secretary of Agriculture, I sat at the feet of John R. Mohler. (Applause.)

PRESENTATION OF PAPERS

PRESIDENT KINSLEY: The next number on the program is "The Trend of Veterinary Practice," by Dr. W. H. Welch.

(Dr. W. H. Welch presented his paper, which was published in the JOURNAL for November, 1922, page 140.)

PRESIDENT KINSLEY: We have one more address, and I know you are all interested in it. It is the first general paper we have had concerning military operations of the War Department. I take great pleasure in calling on Major Robert J. Foster, who will discuss briefly "The Veterinary Reserve Corps."

(Major Robert J. Foster presented his paper, which will be published later.)

The meeting adjourned at 11 o'clock p. m.

LARGE-ANIMAL CLINIC

WEDNESDAY MORNING, AUGUST 30, 1922

The Large-Animal Clinic was held at the stockyards in East St. Louis. The first session convened at 8 o'clock a. m., Dr. H. E. Kingman presiding.

TUBERCULIN REACTORS—D. F. LUCKEY

Dr. D. F. Luckey gave a demonstration of reactors to the tuberculin test.

DR. D. F. LUCKEY: We started in on a bunch of cows that have just recently been tested and condemned, and, as you know, we would not get the type of reactions that we would expect in a bunch of cattle that had not been previously injected. We handled this lot of cows so that we would have right at this hour the maximum of ophthalmic, intradermic and subcutaneous reactions, but I failed completely.

These nine Holstein cows were injected a week ago yesterday and shipped in here, and then Sunday morning I gave them an intradermal injection. The 48-hour observation yesterday morning at 8 o'clock showed much more pronounced swelling than they show this morning. The last four cows showed good reaction. Two show slight reactions to the intradermal tests.

Tomorrow at 3 o'clock these carcasses will be hung up at Armour's with the lesions in, with the numbers of the cows corresponding to the numbers that are on them now, so you can take your test sheets and compare the numbers and compare the tests with the lesions.

This herd was examined at the forty-eighth hour and at the end of the seventy-second hour. If I went into a herd of cattle with as bad a history as this herd had, I would examine them at the forty-eighth hour and the seventy-second, and I would keep on examining them until they quit reacting. That is why I say we can't follow the rule. We have got to go down the line and test these cattle and get the reactions if we have to stay with a herd a week. Ordinarily they are through at the seventy-second hour, but occasionally a cow will show a good reaction on the fourth day.

Probably Dr. Kiernan will have some specific information on that point.

DR. KIERNAN: On all tests you will get late reactions. I think there are exceptions.

DR. LUCKEY: There are exceptions, but they will do a lot of damage in a herd of cattle like this. It pays to be very thorough. Some of these are very valuable cows; they are all registered. There were 86 head. We made a guess we would find 40 or 50 reactors, and fortunately we only had 15. Some of these are

high-priced cows, and in that kind of a herd it pays to be very careful.

QUESTION: What is the maximum amount or about the regular amount of tuberculin you inject?

DR. LUCKEY: I am somewhat at sea. I just make a rule of injecting enough to produce a very plain and visible lump, showing that the tuberculin is in there. I have been of the opinion that the amount of tuberculin didn't matter much, and I was rather inclined to think that if you could reduce the injection down to 2 minims you would get better reactions. Dr. Augspurger told me last week he injected the left fold with 2 minims and the right with 5. I got better reaction with the 5 minim injection. I don't know whether that will be a regular thing or whether that will be a mere instance. I am not prepared to answer questions specifically, saying that the dose should be 2 minims or 5 minims, but I think the average man will find that he has averaged 4 or 5 minims.

QUESTION: What is the size of your subcutaneous dose?

DR. LUCKEY: The chart there shows that the first six cows got 6 c.c. yesterday after 5 o'clock and the last six got 8 c.c., and you will see that it made very little difference in the reactions; probably the last six cows reacted a little better. I will let you study the chart.

QUESTION: Are you using the so-called deep intradermic injection or very superficial?

DR. LUCKEY: I make the injection with an 8-inch needle, and I would call it a rather shallow injection. Back in 1917 I started with scratching the skin, and I got nice reactions. I wouldn't be sure about it, but I am inclined to think that the shallow injection is the proper one.

On this subject of tuberculin testing, I want to make another point that has occurred to me. If you inject 6 or 8 or 10 c.c. of tuberculin into a lot of cows, and you have an early or late reactor, and miss, you surely have a plugged cow in your herd. In testing cattle I have been going on the theory of keeping all the tuberculin out of them we possibly can. Generally I start on a new herd with a small intradermal injection. Watch out carefully and try to eliminate all the reactors. Take out all reactors and disinfect. In ninety days repeat the intradermal injection and try to take out the recent developed cases. Then let them go a year from the first test, and my preference would be to give them a 2 c.c. subcutaneous injection. If you get reactors still, remove, clean up, and in ninety days give them a 4 c.c. injection. If the herd is not sound then, you are getting into pretty deep water, because you might then conclude that you have a nonreactor in the herd.

ORGANS OF REPRODUCTION—W. L. BOYD.

CHAIRMAN KINGMAN: Dr. Boyd will give a demonstration of gravid and pathological uteri.

DR. W. L. BOYD: We have some very interesting specimens here this morning, both of the gravid and ungravid normal uteri, and other reproductive organs. We also have some very interesting pathologic conditions. These specimens are practically all fresh, so that they are almost in a normal condition, and they are much better to handle and much better to demonstrate with than the frozen specimens. Nearly always the frozen specimens have undergone some postmortem changes, some changes indicating that they have been broken down, and after they are thawed out they never have the same shape as the fresh specimen.

It is well for one who is doing sterility work or expects to take up treatment of sterility in cattle to familiarize himself or reacquaint himself with the anatomy of these organs and to find out their position in the open heifer or the unbred cow. Determine or learn to determine the difference of position in case the uterus be gravid or nongravid, or whether it be in a diseased condition.

It is surprising what one can determine after he becomes familiar with the technique employed in a rectal examination or manipulations. As one keeps up this sort of work he becomes a better diagnostician of many diseases other than those of the reproductive organs.

There is a rather common disease among dairy cattle, sometimes resulting as an aftermath in mastitis, or possibly after metritis, a case wherein the kidneys become infected, and there is a pyelonephritis, or perhaps some other infection of the kidneys. The kidneys can be readily palpated after one has had a considerable amount of experience; the uterus can be palpated, and one can palpate some of the lymph glands and readily detect what is known as fat necrosis. Fat necrosis is quite a common condition among fat cattle, among the dairy breeds, especially those animals that have been fed on a rather high protein diet and pushed for a milk record. Fat necrosis is also quite commonly seen in some of the beef breeds. One soon learns to recognize the shape of the bladder and its consistency and to differentiate it from the uterus. Many times the bladder will be distended and pushes the uterus out of its normal position, and in attempting to diagnose pregnancy one may feel the bladder and think perhaps that is a distended uterine horn and think that there is a case of pregnancy.

In the small animal one can tell a great deal about the reproductive organs through rectal palpations, so the more of this sort of work we do the more efficient we become. I think that everybody who has an opportunity should first station himself in a packing house for two or three days. You will have an opportunity to examine the organs and even to examine some of the cows before they are slaughtered, and see the difference in the different stages of gestation and in the different periods of growth in the corpus luteum. One who avails himself of such an oppor-

tunity is going to be much better prepared to know what he is doing when he attempts to treat the sterile animal or to make a diagnosis of pregnancy.

One should be absolutely familiar with the normal organs, because there are some changes in a diseased condition which resemble pregnancy, and if he is not familiar with those conditions he sometimes gets into serious trouble.

The ovaries of the cow can be very readily palpated. In most cases, in the unbred heifer or the open cow, part of the uterus is on the pelvic floor, but of course just as soon as gestation begins the uterus extends forward and becomes abdominal in position rather than pelvic. The beginner in making rectal examination frequently introduces his hands and arms too far, slides over the uterus and the ovaries, and wonders why he is unable to find those organs. Again, one should use great care in making rectal examinations so as not to cause any more hemorrhage than is necessary. The less hemorrhage you produce the better, and it looks much better to the owner. By careful manipulation you can put a great deal of pressure upon the ovary through the rectal wall. Many corpora lutea can be suppressed by pressure exerted on the rectal walls without any danger. Some of them are so deeply embedded that it is an impossibility to remove them in that way. In those cases one can remove them by exerting pressure through the vaginal wall. Of course, the walls of the vagina are very heavy; this organ is quite muscular and will stand a great deal of pressure, and little or no harm can be done working through that channel.

The corpus luteum is a gland of internal secretion, a gland made up of large epithelial cells. The coloring matter is known as carotin, similar to the color you see in yellow corn and other material of that sort. This corpus luteum forms in the ovary after ovulation, after the ripe follicle has been discharged; then there is some hemorrhage. This undergoes absorption, and the cells known as the cells of the corpus luteum begin to multiply. There is some debate perhaps as to just the origin of these lutein cells, but they probably come from the cells which go to make up the ripe Graafian follicle. Then these cells begin to multiply and grow in size. If the animal is not bred, this yellow body (the corpus luteum) grows to a certain size and then starts to degenerate in most cases, and disappears again in twenty-one days, so that the animal is again in estrum. If the animal is bred and fertilization take place, the corpus luteum grows and keeps multiplying in size until you wonder if there is any real ovarian tissue there; the corpus luteum takes up almost the entire part of the ovary. You may press out a corpus luteum, and then if through straining the cow removes the ovary from your hand, you may have difficulty in picking up what is left of the ovary; that is, there will be a very small amount of tissue left, but you can soon recognize that through grasping the broad liga-

ment. You will find a very small amount of tissue left in some of those cases because the corpus luteum grows so large and takes up most of the ovary.

We have the false and the true corpus luteum, and we have them forming every time that ovulation takes place. In case conception or fertilization does not take place, this yellow body soon disappears; but in case of fertilization it starts to grow and grows to a size of an ear of corn. In some cases where fertilization has not resulted the corpus luteum does not degenerate, but grows and becomes as large as a normal corpus luteum or the corpus luteum of pregnancy; and then that corpus luteum inhibits, in many cases, further ovulation, so that the cow is not coming in estrum any more, and the owner wonders why this animal does not come in heat.

The corpus luteum of pregnancy has a considerable amount of function to perform in relation to the development of the fetus. It is well known that if the corpus luteum is pressed out at the early stage of pregnancy it is invariably followed by an abortion. Sometimes if the entire organ is not removed, in case we are trying to produce an abortion, and a small amount of it remains, the abortion does not take place in many instances, because there is enough of the secretion to govern development of the young animal; and so it goes on and multiplies and the cells regenerate, and we have a corpus luteum formed again.

It is remarkable, in some cases where one wishes to produce an abortion by expulsion of the yellow body, how difficult it is at times, by pressing out the corpus luteum, really to cause an abortion; but if it is removed in its entirety the abortion takes place within a few days following. So the corpus luetum has the function of governing the development of the young animal in the early stages of gestation. It has this function also: It has something to do perhaps in the relation of estrum. We believe that when a cow has recently calved and is not coming in heat, in two to four months and sometimes longer the corpus luteum in some way is interfering with estrum. We think it is partly due to mechanical obstruction; that it is in the ovary in which the yellow body is located; the ova are not ripened and do not get a chance to come to the surface and escape. The opposite ovary is apparently normal in every respect, yet ovulation does not occur there. So if this yellow body is pressed out, and there are no other pathologic conditions in the animal, estrum will take place within about three to five days, sometimes earlier and sometimes later.

From our experience the corpus luteum can be very safely removed if one will work carefully and take precautions to check any hemorrhage that may occur. The pitfalls connected with removal of the corpus luteum are not serious. Occasionally we may get a serious hemorrhage and even death, but as a rule the conditions following are not bad. Occasionally upon the removal

of a corpus luteum we will notice, if the cow be eating at that time, or ruminating, that rumination ceases and the animal bloats. There may be some colic symptoms; this is evidenced by kicking at the belly wall, perhaps attempting to lie down; but those symptoms soon pass away. If you examine that animal again, however, sometimes, or in occasional cases, you may find within a few days that there is a large hematoma which has resulted from the hemorrhage. Again you will find that the cavity or the crevice that is produced by the expulsion of the corpus luteum will sometimes fill up with blood, and this blood will clot and become organized and undergo certain changes; and if you examine that case again you may think there is a yellow body at that position, but that is really the clot of blood, and it will soon undergo organization and be reabsorbed.

I do not know of any more satisfactory cases that can be handled than those that are not coming in estrum due to the retention of a corpus luteum. All retained corpora lutea are not responsible for absence of estrum. Some cows will have a retained corpus luteum, and yet they will come in estrum; but those are the unusual cases, the exceptions to the rule.

The vagina is a very strong muscular organ, lined with stratified squamous epithelium, and this heavy epithelium protects the organ against infection, so that we do not find many pathologic conditions in the vagina which cause sterility. You will find granular venereal disease, and this condition is present in most females. We find, as a rule, that is does not produce a serious vaginitis, although occasionally we will see a rather serious vaginitis; but as a rule, on account of this stratified squamous epithelium the organ is really protected against infection.

Frequently we hear men say that they examine the cervix and find it to be indurated; that it is harder than it should be, and tightly closed, and they did not think conception could take place. In the normal structure it should be rather tightly closed; of course it is more tightly closed in case of pregnancy. The cervix in its normal, healthy condition should be a rather pinkish red or reddish color, and the lumen or opening is rather small. The organ feels rather fibrous because it is made up of fibrous tissue. It is about 3 to 4 inches in length. It is composed of about three angular rings and has longitudinal layers of mucous membrane, and these cripts or folds are rather deep. In case of inflammation of the cervix the mucus covers over these crypts, so that if any bacteria be present they are pretty well hidden and they are hard to reach with medication. This organ is a rather spiral shaped canal and rather difficult to dilate.

The body of the uterus in the cow is rather short. The horns of the uterus or the entire organ in a nongravid condition, especially in the young animal, can be put in the palm of the hand. It can be drawn on the floor of the pelvis. If you are examining heifers, in almost every case there is no use to have forceps

attached because the uterus can be readily palpated without the use of forceps. In some cases you can even examine both ovaries with one hand.

The corpus luteum invariably is slightly elevated; that is, a part of it is elevated above the surface of the ovary. As it keeps growing and enlarging, a portion of it protrudes above the ovary. The ovary in which the corpus luteum is located is in almost every instance larger than the other ovary, so that you will have no trouble in determining the presence of the corpus luteum in most instances. However, there will be some cases in which the corpus luteum is rather deeply embedded, there is no elevation on the surface, there is no elevation at all, and the only difference is that this ovary is larger than the other; and upon pressure one can determine, frequently, not always, the presence of the yellow body, although it be rather deeply located.

Sometimes we will find two corpora lutea in the same ovary—not very often, but occasionally. It may be that one of those will be a retained corpus luteum and the other a corpus luteum of pregnancy.

When we are examining these organs we always determine first whether or not there is any possibility of pregnancy and if a corpus luteum be present. If the animal has a history of having been bred four or five times without conception, and you think that she has also passed over this last breeding period, if she is probably thirty days since her last breeding and you find a corpus luteum present, it is usually advisable to let that yellow body alone until sufficient time has passed so that you know there is no chance of that animal being pregnant; so the corpora lutea under those conditions should not be removed.

We should familiarize ourselves with this gland of internal secretion, because it is really a wonderful gland; it has many functions to perform, it hastens involution of a pathologic uterus, and when we have a uterus that involutes or comes back to its normal position rapidly, that sort of an organ presents a condition that bacteria do not find favorable for their growth in multiplication. When that organ is abdominal in position and the walls rather thin, the bacteria find their conditions most favorable. So I think that this little gland has a very close relationship to the development of the fetus in the early stages in its relation to estrum and in its relation to the involution of a diseased uterus. I mean by that that in cases of pyometra where the pus may be syphoned off, then a corpus luteum removed, that organ will come back up to its normal position many times within twenty-four hours, and again, sometimes it may take several days; but it is remarkable what will happen in many of those cases, if they are taken early, in which the uterus is greatly distended, filled with pus, cervix partly dilated. If you just remove the corpus luteum, nothing else being done, that organ will commence to undergo involution, evacuate itself, and within

a few days be almost normal in its position again. This does not mean that the animal has recovered and is ready to breed again, because the epithelium has been destroyed to a certain extent and it takes quite a while for that to become repaired.

This little gland (corpus luteum) as it is removed is about the size of an acorn, and it leaves a rather large opening.

After conception takes place the cervix begins to fill with a sort of mucus. The mucous plug of pregnancy is a very sticky, adhesive-like material, rather difficult to break down. The uterine seal is nothing more than a mucous plug, and this mucus is very adhesive, and when the fingers come in contact with it it sticks to them and gives you a sort of an idea that there is a vacuum there. Sometimes this may be a little misleading in certain cases of cervicitis; the discharge from the cervix becomes rather adhesive, and it may confuse you and make you think it is a mucous plug.

The cervix does not always close tightly after gestation. Sometimes the cow will go through the full period of gestation without a tightly closed cervix, and even there may be some discharge all the way through her period of gestation; but those are exceptions to the rule. The cervix is invariably tightly closed, and this seal is formed in the very early stages, so that in the heifer or the cow that are fifty or sixty days along in gestation the uterine seal is usually rather easily detected.

We have an organ here in which there is a right horn pregnancy. It is in the very early stages, but one can easily tell that this horn is much larger than the nongravid horn, and when one feels of it in the rectal palpations it has better tone, and as one presses on it it rebounds or springs back up against the hand quickly. There may be tied-in depressions; these tied-in depressions or places are rather common, as we see here in the early stages of gestation.

On this side we find the corpus luteum of pregnancy, and it is slightly elevated, or part of it extends above the surface, and we find a very small fetus. I suspect, judging from the size of it, it is possibly fifty days or maybe a little longer in gestation.

I feel that one can, as a rule, in most heifers, determine preg nancy in thirty-five or forty days, and sometimes earlier; that is in heifers with their first calf. In cows the changes are not so rapid, but in many cows gestation can be diagnosed safely as early as fifty or sixty days, and sometimes earlier. These changes in case of pregnancy begin in whichever horn the young animal is located; it begins to develop rapidly in size and increase its length, so that as one manipulates it by way of the rectum, he will find that the gravid horn is much larger in caliber and is more elongated, and then you will find on that side the presence of the corpus luteum.

If there are any questions about the corpus luteum, I would like to have you bring them up at this time.

CHAIRMAN KINGMAN: Is the color of the true and false corpus luteum the same?

DR. BOYD: I think they are about the same in color. As I said before, it is mainly carotin. These cells are just large epithelium cells. Histologically they resemble very much the cells in the adrenal gland.

I don't believe the oviducts can be palpated unless they are diseased. Perhaps they can occasionally, but as a rule the oviducts are very small and they are difficult of palpation unless they be diseased; but as a rule the corpus luteum can be rather easily palpated.

The mucous membrane or mucous lining of the uterus is entirely different from tnat of the vagina. The mucous glands are rather large in number. We have those large lymphoid bodies in the submucosa and lining of the uterus; in one of the specimens it is destroyed; the epithelium is changed. If these changes be extensive, it means frequently that the animal is permanently sterile, and a good many times temporarily sterile, that condition lasting over a period of months.

If you are examining large numbers of these animals, you will often say to yourself, "I believe that cervix is too tightly closed, and I don't understand it; I believe we ought to dilate it." But I think as a rule there are very few cases of that sort, where the narrowness or the tightness of the canal is due to just the anatomical formation without any signs of disease.

QUESTION: Do you think it wise to suppress the corpus luteum in case of pyometra?

DR. BOYD: I have seen cases where I thought it would be unwise, but in most of them I believe it is wise to suppress the corpus luteum. Some contend that it sets up salpingitis. On the other hand, the involution of the uterus sometimes does not take place if we just depend on syphoning off the contents and then using perhaps some mild antiseptic. I believe in pyometra, as a rule, the infection is not so serious and the organisms are not so virulent, so that in most instances I believe the corpus luteum can be safely removed, and when it is removed, evacuation takes place more rapidly and the organ undergoes involution more rapidly. You may syphon off the contents and find that animal in heat even the next day, but again that organ may refill. I have seen them where the contents were syphoned off and the organ refilled in just a few days, and kept doing that over and over.

QUESTION: What per cent have mummified?

DR. BOYD: I don't know. Sometimes in case of mummification of the fetus the fetus is so large that we have trouble in enucleating or removing the corpus luteum, and again upon removal of the corpus luteum we have to break down the seal, sometimes injecting the uterus with some oil. Again, if it is not a case of too

long standing, the removal of the corpus luteum alone will cause a mummified fetus to be ejected.

QUESTION: Can you tell us more about fat necrosis?

DR. BOYD: I wish I knew more about fat necrosis. I want to bring it up because sometimes it will confuse you with these normal organs. Fat necrosis is usually in around the pelvis, and then it follows in along the intestines, and frequently we find it up around the kidneys. Fat necrosis is usually sort of an oblong shape, sometimes rather flat, and very hard, and it may be mistaken for something else. I know of cows that are suffering with extensive fat necrosis and yet they are breeding all right. I merely wanted to bring it out in its relation in the examination of these organs.

DR. DEVINE: In regard to removing the corpus luteum, if it is diseased there isn't any one thing that would do as much good as taking it out. If there is an infected corpus luteum which may infect the tube, what good is it to the ovary to leave it there? The diseased corpus luteum should come out, and there is nothing that would help a case of pyometra like taking the corpus luteum out. I would prefer to empty the uterus first and then take the corpus luteum out afterwards.

DR. BOYD: I feel that if it isn't removed, what good is it there, and even if the cow does become diseased on that side, there is still opportunity to breed from the other side.

As Dr. DeVine said, if the contents of the uterus are first drained off, then the organ is easier to handle and you can bring it into position better; but in some of our experimental work we wanted to show just what that corpus luteum was capable of doing, so we didn't do that.

QUESTION: Are there any good results to be obtained from the removal of the corpus luteum in an ordinary case of retained fetal membrane?

DR. BOYD: I had an experimental case of that, and I came to a great deal of grief. It is the only one I have tried. There was a retention of the fetal membranes in this animal, and I thought I would just remove the corpus luteum and see what the results would be. I believe it did loosen the membrane up rather rapidly but there developed a great deal of ovaritis, salpangitis, and massive adhesions of the tube to the abdominal wall.

I want to speak of the experimental animals that we gathered up that had pyometra. Some were short standing cases and some long standing cases. They all had a large uterus which was abdominal in position, from which, if you were making a diagnosis of pregnancy and resorting only to rectum manipulation, you would say there was a good strong chance of that animal being pregnant; but you would find the cervix slightly open, and when the cow was in a standing position there was a discharge of pus; but there was an absence of heat, which would lead one to believe that the animal was pregnant. But

upon the animals lying down you would find pus, sometimes malodorous and sometimes not, and sometimes some mucus with it, usually thick and creamy-like in consistency, and yellowish gray in color. We took those animals and pressed out the corpus luteum in every one that we could, and did nothing further. We just wanted to see what would happen in the way of hastening evacuation and involution. In almost every instance we found within twelve to twenty-four hours that that organ would completely evacuate itself and that it underwent rather hasty involution, came back up into position, and in a few days, instead of pus being discharged, there was rather a glairy-like mucus coming away with some particles of pus mixed with it. It was surprising just how that yellow body would bring those results. If they were long standing cases, many times the corpus luteum did not seem to bring about that same result.

In the treatment of such an animal I believe first in removing the contents before the corpus luteum is pressed out. It makes it easier and I think safer. The organ then is brought in the pelvis, and there it can be rather easily manipulated.

DR. FERGUSON: I would like to ask if you prepare cows for the operation of the removal of the yellow body to bring about estrum, if you consider it necessary to prepare dairy cows.

DR. BOYD: I don't know that it is. Perhaps it might be wise to do it, but in most instances we feel that it can be done without putting that cow through any form of preparation; that the corpus luteum in many instances can be removed by pressure exerted by the way of the rectum. However, if it be done by the way of the vagina, I would believe in preparation there.

DR. FERGUSON: What I had reference to was the sick period afterwards, the colic and the cessation of the milk secretion, etc. I have experienced this trouble in a good many herds where they were on full feed and full milk flow. A cow may be just on the verge of indigestion, overfed, and when the corpus luteum was removed the sickness that resulted afterwards would produce quite a serious case of indigestion, quite alarming to the owner. The last year I have made it a practice to empty out those cows before actually performing the operation, and I believe that we are getting much better results. If the animal is dieted and prepared a little before the operation the after-sickness is much shorter, the after inconvenience, I might put it, is much shorter, the rumination is resumed much sooner, and the animal gets back to normal much sooner.

DR. BOYD: Probably that would lessen the cases. However, it has been my experience that the percentage of those cases is rather small. In one herd where we have kept some records we have found that a very large percentage of these animals showed no difficulty or no inconvenience; there was no interference in the milk flow and no interference in the way of digestion. How-

ever, we get those occasional cases, and sometimes they are rather embarrassing cases to explain, and they do cause the owner more or less worry. I recall one instance where a cow was lactating very heavily on official test work, and the removal of the corpus luteum really seriously interefered with lactation, so the herdsman says he knows of a way to dry a cow up. It may cause a serious condition of that sort; that is, it may cause a falling off in the milk flow. However, in most cases those men are willing, unless the cow be making a big record, to sacrifice that record and get the cow back into breeding again; but that should always be explained to the owner. It should be explained to him that possibly it may interfere with the milk flow, and let him decide upon whether or not he should continue this cow on test, or whether he should take a chance of her milk flow being disturbed, or whether he would rather have this animal come in estrum and breed again. They all want, if possible, to get a calf each year. The higher the breeding efficiency, the better their herd.

QUESTION: Is it known how long after you have suppressed a corpus luteum from a cow before she aborts?

DR. BOYD: In our experience we have had a number of cases wherein purebred females have been bred by a scrub sire, or in some of the beef breeds in particular where they have been bred too young, so that their calves would not be eligible for registration, and the owner wondered if they could not be aborted. Most of these animals were in the early stages of gestation, perhaps under ninety days. The corpus luteum has been removed, and in almost every case (there have been exceptions to this) the abortion would occur in about five days, sometimes three days; but we have found in some instances that the abortion did not occur at all, and we felt that some of those cells were left there and they regenerated, and there was enough secretion left in order to hold that fetus in position.

You will hear people say: "Well, I examined a good many cows for pregnancy, but I never touched the corpus luteum." But if they were trying to abort certain individuals, they would find out they might have a hard job on their hands to remove that corpus luteum, especially if the animal was four months in gestation and they couldn't mainpulate it well. Sometimes it is a hard job to abort an animal by the removal of the corpus luteum, showing it is not going to bounce right out of its position by manipulation. I believe in manipulating them very easily, however, and I think that too many times the pressure exerted on ovaries and perhaps on other of the reproductive organs is too severe. We hear men say: "When I first started on that animal the ovary wasn't so large, but it seems to grow larger every time I manipulate it and becomes more fibrous." I think

that palpation is oftentimes too severe, but the corpus luteum is so embedded in its normal position that one can manipulate it in pregnancy without disturbing the position of the fetus and not be afraid of producing abortion, and he will find that out as he is called to abort these animals that have been bred.

QUESTION: Has any experiment been made in preparing the extracts of these yellow bodies and injecting it into the cattle?

DR. BOYD: Yes. Some work has been done. I believe Dr. Hadley has done some work along that line.

DR. HADLEY: Nothing very much.

DR. BOYD: The corpus luteum has been used in cases where there was an absence of estrum, in which apparently there was no corpus luteum, and it has been said it will bring about estrum. We have tried it out, but our experience has been very slight. We have fed and injected the corpus luteum extract. We have macerated the fresh organ. It is said to bring about estrum in those cases wherein there is no corpus luteum present, but it is not very often that we find a cow that doesn't have a corpus luteum present, and its manual removal is usually followed by estrum within a very short time. The corpus luteum extract I know is being used in some cases wherein there is an absence of estrum, and it may be used in cases of certain pathologic conditions; it is possible that it is. It is said that some of the extracts of the other glands of internal secretion are being used in cases of cystic ovaries.

In examining heifers in case that they be freemartins, as I stated before, the organs are undeveloped. Sometimes a freemartin will be coming in heat, and you will hear occasionally where a freemartin has bred successfully, and if she has she can't be classed as a true freemartin. It is said this is due to the fact that the male organs take the place of the female organs. You will find that the vagina is very small, that the vagina is a blind sac, and on rectal examination you will find two cords that represent embryonal tissue, and then as you go farther you may find one or two ovaries; but you will immediately recognize that there is no formal formed uterus present; so it isn't hard to determine a freemartin by rectal examination. And again, going through these animals you will find those in which the uterus is rudimentary or perhaps one horn of the uterus is missing, and occasionally it is possible to get one of this sort of individuals to breed, but as a rule they are not fertile. I know of one animal in which the left horn of the uterus is missing and she breeds successfully in the right horn. She has a well-developed left ovary, but the left horn is missing.

The malformed organs can be rather easily determined, and as you are going through, taking an inventory of the reproductive organs, you will find those conditions right along. We have a very interesting specimen here; it is one of the few I have

ever seen. It is a good deal like one of the slides that we had. The uterus is practically normal in size. The left ovary is missing. The organ has a loss of muscle tone; the cervix contains some mucus, but the outer part is open. On the right side there is a rather large tumor; it may, as suggested by Dr. Fitch, have originated from a corpus luteum. Possibly it has, but we find this sort of thing causing sterility. Many conditions are causing sterility other than those connected with abortion disease.

I feel that the *Bacterium abortus* Bang is not responsible for many of these cases, but it does pave the way for these other bacteria. It is possible that the *Bacterium abortus* Bang may, in some animals, produce enough changes, but as a rule it does not

QUESTIONS What would be the chance of that cow breeding with that tumor?

DR. BOYD: I would say not very good.

QUESTION: What about removing it and breeding from the other side?

DR. BOYD: That could be removed. I can't tell you how the other ovary looked, but that could be removed through a flank operation. It may be advisable to do that. However, on the other hand, if she had been sterile for quite a while and had not been breeding, and not of a good breeding line, perhaps it would not be advisable to operate. However, that is not so large but that it could be removed by a flank operation.

Remember that the ovary in the cow is rather small, as you have seen in the specimens that have been passed around. However, you may examine a number of animals in which the ovary may be quite large. The ovary might be as large as a walnut and still be normal, that is, still be able to ovulate; so that one can not say that the ovary of the cow in its healthy condition is a certain size or of a certain weight, because it varies so much.

Here we find another case of a well-formed seal, a tightly closed cervix, and an early stage of pregnancy. You can see perhaps the beginning of the formation of the cotyledons. One can palpate the cotyledons in four months' gestation.

Here we find a nongravid uterus, and we find that in the right ovary there is a large corpus luteum present. The left ovary is quite large and contains a cyst. It also has many scars showing that it has been ovulated. Sometimes upon examination of heifers you will find that the ovaries are smooth and suggest that ovulation is not taking place. In a number of those cases perhaps the follicles are not being fully developed and therefore are not being discharged, so there is a condition of a treated follicle not being fully formed.

QUESTION: What would you say of a cyst of that size?

DR. BOYD: It is a rather small cyst. Perhaps it has no significance; again, it might be causing that animal irregularity of estrum, and if it was, it should be broken down. The cow that

shows irregularity of estrum and becomes a nymphomaniac is suffering with cystic degeneration of the ovaries. The cyst may not be large, but these same symptoms can be present though the cysts be very small. Usually they are quite large, and the ovary becomes stretched out into a thin sheet-like structure, and when the cyst is broken down and the organ returns to its normal condition the interstitial tissue and the glandular tissue rapidly regenerate.

QUSTION: How do you handle the cyst?

DR. BOYD: Most of the cysts can be ruptured through the walls of the rectum. Again, they may have to be ruptured by pressure exerted through the walls of the vagina, and again it may be necessary even to trocar them, in case the wall is rather heavy and not readily broken down. Sometimes upon pressure the walls of the ovary do not break right open and you have a sensation that it is just slowly evacuating itself. Many times those will refill, and the ovary will refill sometimes as early as three or four days, and sometimes in seven or eight days it is just as big as it was the first time it was broken down.

I would like to say a few words about the organs of the male. In rectal examination of the male we can determine certain pathologic changes, that is, if they be rather well advanced. However, in many cases we may pass over them. There may be certain cases where pathologic conditions are causing sterility in the male. I would like to discuss those of the testicle, wherein certain changes are causing sterility in the male. I want to say also that the problem of sterility in the male is of considerable importance in the handling of an outbreak of this condition or in the handling of this condition in a large herd. It is a well-known fact that a big reputation of pretty nearly every breeder has all been made from some great sire that he has secured, and he invariably wants to hold on to that sire and get just as many calves as possible, and he keeps using him right up into advanced age. Finally he begins to notice that quite a number of the cows that are being served by this animal are failing to conceive, and he begins to take inventory and find that some of these animals put to a younger sire will conceive, and he finds out that this animal is not successful in breeding any more, probably due to advanced age.

As far as diseased condition of the testicles is concerned, occasionally we find that injury to the testicles has resulted in abscess formation, and though one of them be injured and remain apparently normal in size, frequently this animal is sterile from both organs, and even if one testicle is removed, by castration on one side, this animal will still be sterile. However, if this operation were performed early, possibly this animal would still be fertile; but they will become sterile through injury in that way. Injury to the testicle of the bull is not at all uncommon; injury along the sheath is not all uncommon; and these injuries fre-

quently result in adhesions, and these adhesions are such that they are hard to break down and get good results. They frequently recur, so that many good sires are sterile because of adhesions in that way.

In the Angus breed the sire protrudes a part of the prepuce, and this prepuce sometimes becomes infected. Sometimes the testicles become greatly enlarged, due to *Bacterium abortus*, and present the appearance of tuberculosis lesions and may look very much like tuberculosis. We may find some lesions in the seminal vesicles, perhaps occasionally in the prostate. The prostate glands and the seminal vesicles are rather lobulated in the bovine male and can be enlarged rather rapidly and rather easily palpated. So I say that we should pay attention to sterility in the male as well as in the female, and look the animal over carefully, palpate the testicles, examine the prepuce, the sheath, find out whether or not there are adhesions there, find out whether or not there may have been a broken penis and adhesions have formed as a result of that, together with abscess formation.

I would like to say another word about the corpus luteum after it has been expelled. The corpus luteum, after its expulsion, perhaps may fall down in the region of the bladder or in around the coils of the intestine, and there remain for perhaps three or four months before it is finally absorbed; but it undergoes absorption there. Sometimes it may be surrounded by blood. We have made examination as late as four or five months after it has been removed and still found some evidence of it around in the mesentery or the region of the bladder, where it is undergoing absorption. It takes some time before it finally undergoes absorption.

CHAIRMAN KINGMAN: While Dr. Boyd is arranging the specimens we will call on Dr. Bemis. Dr. Bemis has been doing some work at Ames on the estrous cycle, and he is going to tell you about some of it. After his talk he will demonstrate on the live animal the results of their observations.

DR. H. E. BEMIS: Dr. Kingman has said that I have been doing some work on the estrous cycle. He should have said Dr. Murphey, of the Department of Anatomy, who has really been doing this work. We have been making observations with him, and then carrying it on to a practice bearing which we think it has in doing sterility work. We believe that close attention to details is very essential in coming to proper conclusions in doing sterility work, as in almost any other kind of work.

This is how Dr. Murphey has summarized his observations:

A. Diestrum.—Os circular; vagina comparatively dry; very few epithelial cells; practically no leucocytes.

B. Estrum:
   Proestrum:
   1. Bright cherry red color of vestibule due to congestion of bulbus vestibuli. (Inflammation.)

2. Enlargement of vaginal part of cervix due to swelling or ripening of mucous cells.
3. Beginning of the outpouring of mucus from the cervical canal.
4. Slight swelling of the vulva.

Estrum (or heat):

1. Signs: Bawling; uneasiness; depression of lumbosacral articulation; on digital manipulation of clitoris, receptive movements. (Chronic heat; cystic ovaries.)
2. Swelling of vulva.
3. Vestibule deep red to mahogany.
4. Involuntary contractions of vestibular sphincter.
5. Os uteri, a transverse slit.
6. Great swelling and protrusion into the vagina of the folds of muccus membrane of the cervix. The folding is more marked, and arranged in three to four rows. (Evans says due to evagination of the encircling rows of folds. In old cows mostly two encircling rings, while in virgin heifers mostly one and a half rings.)
7. A marked outpouring of clear, viscid, cohesive mucus.

Postestrum:

1. A sudden cessation of estrum or heat manifestations.
2. A gradual cessation of the anatomical changes. The vulva becomes wrinkled. The deep color of the vestibule remains relatively longer; the enlargement of the cervix gradually subsides; mucus is discharged from the os for two or three days (not pathological). The vaginal mucus is streaked with, or shows white flocculi. (Since this we have found red spots or streaks, erythrocytes, due to red blood cells intact (discharge isotonic) in a part of the cases, probably due to desquamation of the surface epithelium as is known to occur in other species.) Later it becomes gummy, sticky and adhesive; it is opalescent. The white material is both epithelial cells and leucocytes. However, some of the latter are present in smears made directly from the os. Microscopically the cells show increasing degeneration, step by step, with the increasing gumminess of the mucus.

Diestrum:

Estrum: Uterus:

1. Marked congestion. (Not pathologic degeneration.)
2. Edematous, glassy, mucous membrane folded in hillock fashion.
3. Petechiæ on both the cotyledonous and intercotyledonary mucous membrane.

That is merely a brief summary. Probably you will not carry very much with you from this presentation, but get the point that it is important to note carefully the color changes and the character of the mucus and the swelling or protrusion of the cervix during the various periods of estrum, and learn for yourselves the things which are normal processes in order that we may not mistake them for abnormal.

I shall not be able to show you these various conditions, because I have not been able to get cows which are in the various stages; but I do want to show you something which I think is of a great deal of value in making examinations of the vagina

and cervix, and that is the use of this glass speculum, which was thought of by Dr. Murphey, in making these observations where he wanted normal colors with the least irritation possible.

This is merely a glass tube an inch and a half in diameter. This one is 18 inches long. It may be from 15 to 18 inches long, and should be perfectly smooth on the ends. This speculum can be easily introduced into animals of almost any size. I have a small speculum for very small animals, and larger speculums can be used on larger animals; but this is the average size, and can be used on practically any animal.

Those of you who have been doing sterility work know that in the small animals and young animals there is perhaps not much to do on the vagina; still our examination is not complete without an examination of the vagina and cervix. There is difficulty in entering the vagina in any other way, and by the use of this speculum you can get a view of the mucous membrane, the position of the cervix, its condition, and complete your examination very satisfactorily and with very little trouble. It has become a regular part of our equipment and a regular part of our routine in making sterility examinations.

I am going to put an animal in the stocks here and introduce this speculum, and then with the use of a flashlight you will be able to see the color of the mucous membrane and the position of the cervix and something of the size of the cervix in its normal position, which I think is something of value to those who have not been doing this work.

(Proceedings to be continued.)

L. M. ESTABROOK SIGNS ARGENTINE CONTRACT

Leon M. Estabrook, associate chief of the Bureau of Agricultural Economics, will reorganize and develop the livestock reporting and statistical work of the Argentine Government. He plans to sail from New York with his family January 3 for Buenos Aires, where he will make his headquarters.

The selection of Mr. Estabrook was the result of a cablegram from the present minister of agriculture, Tomas A. Le Breton, who was formerly Argentine ambassador at Washington. While in Washington, Senor Le Breton took a special interest in the organization of agricultural agencies such as the United States Department of Agriculture and the State experiment stations. It was his knowledge of the efficiency of the crop and livestock reporting services in this country that resulted in his request that a man of national reputation in this work be selected to develop similar methods in Argentina.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the New York Academy of Medicine, 17 West 43d Street, Wednesday, October 4, at 8.30 p. m., President MacKellar presiding.

The minutes of the June meeting were read and approved.

Dr. Adolph Eichhorn, Pearl River, N. Y., gave an interesting and highly appreciated talk on his experience in Europe along veterinary lines. The doctor spent three busy months visiting the principal countries of Europe, and as he had a commission from the United States Government to investigate conditions, he got an entrée and could delve into the facts that would be impossible to the ordinary tourist or traveler. He visited veterinary colleges, laboratories, boarding establishments and abattoirs, and got a broad outline of conditions in the various countries. He said the veterinary schools have large enrollments but the schools have not made any progress since prewar times, due to lack of revenue and scarcity of experimental animals and material for demonstration, especially so in German, Austrian and Hungarian schools. Sanitary medicine is being given much attention, and the prospects for the veterinary profession are bright for the future. Contagious pleuropneumonia is very prevalent in continental Europe at the present time. For diagnosis they are using the complement-fixation test. With regard to contagious abortion the same conditions prevail as in the United States. They are using various methods of control. The injection of live cultures is adopted in all of the European countries. Dr. Eichhorn stated that livestock conditions in general are still far from the prewar standard, especially in the defeated countries. In the cities of Germany and Austria there are very few draft horses seen on the streets. Russian ponies and oxen take their places. In France, on the other hand, he said the horses and cattle were splendid. The doctor answered a number of questions satisfactorily.

Drs. Way, DeVine and MacKellar, who had journeyed to St. Louis, gave admirable reports on the A. V. M. A. convention.

They reported the meeting as well attended, the literary program of high character, and they said the clinics were the most outstanding feature of the convention. These covered two days. Those for large animals were held at the National Stockyards, while veterinarians interested in small-animal practice were entertained by a series of operations on dogs and cats at the Planters Hotel. The delegates were unanimously agreed that it was distinctly a practitioners' meeting.

Drs. Gannett, DeVine and MacKellar gave a review of the New York State Veterinary Medical Convention, held at the State Armory, Syracuse, July 26-28. They reported that the meeting was well attended and the literary program diversified and of a high order of merit, with an excellent clinic.

Under case reports Dr. MacKellar said he lately had a peculiar case in an aged gray gelding. History: Horse refused food for 24 hours before the doctor was called to examine him. Owner said he had a disagreeable odor from nose and had difficulty in getting up. Symptoms: Temperature 105, wiry pulse, increased resonance of lungs, bowels and kidneys acting freely, trembling of shoulder muscles, no apparent pain. Diagnosis: Probably internal rupture; "blind case." Horse died during the night.

Dr. I. E. Altman reported the case of a Chow dog which urinated from the scrotum. Passed a catheter through opening and made a diagnosis of calculus. Dog died during the night. On postmortem found a fistulous tract from urethra at pelvic arch to scrotum with two calculi lodged in urethra.

Dr. H. K. Miller reported an Irish terrier puppy 3 months old with a blind bile duct connecting with the umbilicus.

Dr. E. B. Ackerman said he was called to examine a dog for a hemorrhage from the penis. On examination he found a rubber band around the glans penis. He removed the band and the dog recovered. J. ELLIOTT CRAWFORD, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

The annual general meeting of the B. C. Veterinary Association was held in the O'Brien Hall, Vancouver, B. C., on October 6, 1922.

The President, Dr. A. J. Damman, was in the Chair.

The minutes of the last annual general meeting and the special general meeting were reported as read.

The Secretary reported that Dr. F. Torrance, Veterinary Director General, would soon be in the city and that he would be pleased to meet the practitioners. The President appointed Drs. Alton and Chester to arrange the time and place of the meeting with Dr. W. Mackenzie.

A resolution was then introduced by Dr. W. Thomson of Keremeos and seconded by Dr. Strong and after discussion unanimously carried, that this association recommend to the conferring committee of the University of Toronto, that they confer the honorary degree of Doctor of Veterinary Science on the Hon. Dr. S. F. Tolmie, our past president and ex-Minister of Agriculture, in recognition of his work as Minister of Agriculture, his excellent efforts in endeavoring to have the British cattle embargo removed, and his securing of the admission that the embargo was no longer justifiable on account of disease of Canadian cattle, which absence of disease is due to the excellent work of the veterinary profession in Canada; also for his work in cleaning up the disease of mange in Alberta and Saskatchewan, that resulted in the removal of the blanket quarantine and so facilitated the movement of livestock; also of his foresightedness in calling and arranging the Ottawa Veterinary Conference, and his general attitude in always advancing and seeking recognition of the veterinary profession in Canada, as evidenced by his public speeches and his speeches in the House of Commons.

The Secretary-Treasurer then read the financial statement and the President appointed Dr. W. McKay and Dr. R. T. Hoggan as auditors. These later reported the accounts correct, and kindly remarks were made of the Secretary's work during the past year.

The President then made his annual address, outlining the activities of the association during the past year. He thought the Council had done good work in furthering the aims of the association and profession, and in seeking greater recognition, of which he thought we were not receiving our due amount, and he hoped next year's Council would also have good support from the members to carry on the good work.

Under new business Dr. Strong brought up the subject of sanitary inspectors, and said that he thought some of them were doing veterinary sanitary work. He suggested our affiliation with the Sanitary Institute, and said that he thought the veterinary association should be the body to decide the qualification of any person attempting to undertake any class of sanitary work

that had to do with livestock, or with food for human consumption.

Discussion followed and the subject was referred to the incoming Council.

Dr. K. Chester as the association's delegate to the Ottawa conference explained the objections to the proposed Canada Veterinary Act, which objections had been concurred in by the association at the special general meeting held last December, and a letter was read from Dr. W. Thomson on the subject. It was moved by Dr. Strong and seconded by Dr. W. Alton and carried that this association again ratify the action of its delegate at the conference. The meeting was in favor of a real Canadian Registration Act, that would obviate the necessity of Provincial Examining Boards, to a great extent.

The next item of business was the election of the Council, and the following were nominated, some by written nominations from absent members: Drs. Keown, Alton, Sparrow, Edgett, Hoggan, Howell, Chester, Darby, Swenerton, Ottewell, Damman, Jervis and Findlay.

The President appointed Drs. Strong and Keown as scrutineers. These later reported the following seven elected: Drs. Damman, Chester, Hoggan, Alton, Howell, Sparrow and Ottewell. At a Council meeting held later, the Council elected Dr. Geo. Howell as President, R. T. Hoggan as Vice-President and Dr. K. Chester as Secretary-Treasurer.

Dr. Damman was nominated for President again but declined, as also did Dr. M. Sparrow. Provincial Inspectors Drs. Alton and Sparrow and Dominion Inspector Dr. K. Chester were appointed Examiners, as provided by the Act.

The subject of raising the annual fee from $5.00 to $7.00 was then introduced, to cover the cost of the subscription to *Canadian Veterinary Record*. Speeches were made for and against, but the majority were of the opinion that the $5.00 fee was high enough, and that the members should be free to subscribe or not as they saw fit. There was no adverse criticism of the *Record* at all, but rather the reverse and all expressed a willingness to help as much as possible, which was shown in a practical manner, by ten subscriptions to it being handed to the Secretary immediately after the vote was taken, which also included a written vote from absent members. It was then moved by Dr. Howell and seconded by Dr. Strong and carried that

this association forward the sum of $25.00 to the *Canadian Veterinary Record,* towards the cost of its publication.

This was all the business transacted, no papers being read, in view of the Northwestern meeting that was held last July. A suggestion was made that the next annual meeting be held in the Upper Country, but that rests with the Upper Country members. If they will get together, get busy, choose a place and arrange a program, there is no reason why we should not have another successful meeting as the one held at Penticton some years ago. KENNETH CHESTER, *Secretary.*

CENTRAL NEW YORK VETERINARY ASSOCIATION

The thirteenth semi-annual meeting of the Central New York Veterinary Medical Association met in Syracuse November 8, 1922.

The meeting was opened with a clinic at the infirmary of Dr. J. A. Pendergast, he having just moved into new quarters and had not had much time to prepare for a clinic; consequently the number of cases was smaller than usual.

Case 1. Black gelding; necrotic lower molar, pus extending into the surrounding structures. Surgeons, Dr. J. A. Pendergast and Dr. J. H. Stack.

Case 2. Roan gelding; ulcerated foot. Surgeon, Dr. J. A. Pendergast.

Case 3. Bird dog; goiter; removed by Dr. Clark.

Case 4. Trimming the ears of three pups. This was performed by Dr. McLelon, of Buffalo, in a very scientific manner, and was very interesting.

This closed the clinic and, though short, it was very instructive. Adjournment was taken to the St. Cloud Hotel.

The regular business session was opened at the St. Cloud Hotel at 3 p. m. In the absence of the President and Vice-President, the meeting was called to order by the Secretary, and upon motion Dr. W. L. Clark was elected to act as President pro tem.

Minutes of the last semi-annual meeting were read, approved and ordered placed on file.

At roll call, the following members responded: Drs. Otto Faust, Don A. Boardman, W. L. Clark, J. M. Currie, E. E.

Dooling, J. B. Knapp, Hugh D. Laird, J. A. Pendergast, J. H. Stack, A. J. Tuxill, C. R. Baldwin, F. N. Burk, E. E. Cole, Geo. W. Derrick, W. G. Hollingworth, W. M. Long, Frank Morrow, J. C. Stevens and W. B. Switzer.

Dr. Frost of the State College was present and took an active part in the discussions.

A communication was read in regard to appropriating $150 for 100 copies of the *Southern Tariff Advocate* to be sent to members of the United States Senate for one year.

Moved, seconded and carried that the matter be laid on the table indefinitely.

A communication was then read from the Blue Cross Society in regard to the use of anesthetics in animal surgery.

A motion was made, seconded and carried that a committee of three be appointed by the President, with Dr. Hollingworth chairman of said committee; and that this committee adopt such resolutions for this society as seem in their judgment to be proper and most humane, and to forward said resolutions to the Blue Cross Society.

Dr. Don A. Boardman read a very interesting paper on abortion in cattle. This paper brought out a good discussion, which was opened by Dr. Frost. Many points were brought out which tended to show that cleanliness went a long way toward preventing the disease.

The next paper was by Dr. Clark on Necrobacillosis in Swine. This was also very interesting and brought out many questions and suggestions.

Dr. W. M. Long read a report of a case of pneumonia that he had encountered in his practice. This closed the literary program, but several other subjects came up for discussion in a general way.

Dr. Tuxill asked that the Secretary be requested to write Dr. McAuliff to procure a paper from Dr. Moore that he read at the Southern Tier meeting, and present it at our next meeting.

The following volunteered to furnish papers for the annual meeting in June, 1923: Drs. J. M. Currie, J. H. Stack, Don A. Boardman, W. G. Hollingworth and A. L. Danforth.

W. B. SWITZER, *Secretary.*

B. A. I. VETERINARY INSPECTORS' ASSOCIATIONS OF CHICAGO AND ILLINOIS

A meeting of the Illinois State and the Chicago Local Association of B. A. I. Veterinarians was called to order by the president, Dr. W. H. Daly, in the Government office at the Morris & Company plant, Monday, November 11, 1922, at 9 a. m. This was the first of a series of meetings, commencing on Monday morning, to be devoted to the discussion of subjects to promote the professional interest and efficiency of the B. A. I. veterinarians.

The principal speaker of the morning was Dr. A. A. Swaim, who spoke as follows on organization and the many advantages obtained by organization:

The tendency of the present day in nearly all avenues of life is toward organization instead of individual effort. This in a large measure is the result of existing conditions, and a close analysis reveals the fact that people are moving along the lines of least resistance to obtain certain objectives.

Individual effort must accomplish certain things. However, there are limitations, and it is beyond these boundaries that organization or association becomes invaluable. Efficiency in the individual or the organization must always be a prime factor in the success of the individual or the successfully conducted association. Every individual or organization must appreciate the value of three things, viz. to learn, to think, and to do.

A study of psychology reveals the action or behavior of the individual in connection with and in contrast to groups or organizations of people. Business and business schools have adopted many principles of psychology simply because the human element is the prime factor to be considered.

The present tendency of business is to drift away from individual ownership and toward corporation or organization as better results are obtained. Here is one single idea to explain: Organization has learned the value of the word "please," and every year $8,000,000 is spent in inserting that one word in telegrams only.

Treating the subject in a broad sense, we may say that efficiency, organization and association are the words which compose the synthetic syllabus of correlation preparatory to concentrated action upon a definite objective or action. One eminent man describes efficiency as "maximum results with minimum action," and organization as "a number of individuals in one group or combination actuated or guided by a definite purpose or principle."

There are certain fundamental principles which determine the success or failure of an organization, namely: (1) Proper organization;

(2) loyalty; (3) efficient methods; (4) a definite objective; (5) spirit—spirit of success.

Proper Organization.—By proper organization two subjects of material interest—reclassification and retirement—have been brought to the attention of the public.

Loyalty.—Loyalty to professional standards has placed veterinary inspectors in the scientific class in proposed legislation. Loyalty to our association will make it an efficient force. Any division of our association at this time would be fraught with serious consequences, as a united body is the only hope of success. In fact loyalty is the keynote of success. It is reported that there is an attempt by one of the eastern members to change the name of our association by the formation of "club." Any division within our ranks with so many vital issues at stake must result in decreasing our power, prestige and usefulness.

Efficient Methods.—Efficient methods must be employed to carry out one of the prime objects of our association—"to promote professional efficiency."

A Definite Objective.—A study of the objects of this association stamps it as worthy of existence and your cordial support.

Spirit.—Spirit of Success.—The value of an organization is measured by its service. The spirit of this association is service and to cooperate with the Bureau.

Organization is effective in industry, to the profession, in agriculture, and in social life, as shown by the countless numbers of associations formed in every avenue. They accomplish results where the individual unit ceases to be effective. Select any of the organizations in any group, and it will be seen that those which comply with the above fundamental principles are successful.

A study of a few organizations in the industrial group—Standard Oil, United States Steel Corporation, Ford Motor Company—is convincing proof of the value of proper organization. Why are they successful? Because they comply with the requirements of successful organization. One other reason: There is a master guiding hand behind each, which it is needless to name.

It has been my privilege to be associated for a number of years with a large branch organization of the Bureau of Animal Industry. By complying with five fundamental principles, and with training and experience the inspector in charge has perfected an organization consisting of a staff of co-workers endowed with and trained in the principles of loyalty and efficiency, with the result that the work of the station, though large and complex, stands second to none. The same facts hold good in any line of endeavor, whether the unit of operations be great or small.

In conclusion, allow me to say that I should prove recreant to my trust as a friend and co-worker of such a highly intellectual body of men if I failed to direct your thoughts to the many advantages to be gained and the benefits derived from an efficient organization and

helpful association as represented by the Chicago branch of the National Association of Bureau of Animal Industry Veterinarians.

Let us show our efficiency by adopting progressive methods of organization to secure and to maintain a proper professional standard. This can be attained only by the earnest efforts of a well-organized body of men striving together loyally for a common cause and not through individual efforts alone.

It is said a chain is only as strong as its weakest link. May each member of this association forge each individual link so securely in our whole chain that we shall present a united front on every question of importance which arises. "In union there is strength." However, there is one word which I wish to impress upon your memory in an indelible manner. That word is "loyalty." It is the belief within us which conquers seemingly insurmountable barriers and stamps the word "success" upon our efforts. With a loyal association, performing our duties in a highly efficient manner, and fully cooperating with the wishes of the Bureau, we have a meat-inspection force so valuable that anyone may feel justly proud of his membership in such an organization.

Dr. J. Hannon gave a complete thesis on lobar pneumonia.

A number of pathological specimens were presented and discussed by Drs. L. Enos Day and W. N. Neil.

H. L. HOPKINS, *Secretary.*

UNITED STATES LIVESTOCK SANITARY ASSOCIATION

The twenty-sixth annual meeting of the United States Livestock Sanitary Association was held in the LaSalle Hotel, Chicago, December 6, 7 and 8.

The meeting was called to order by the President, Dr. T. E. Munce, of Pennsylvania, who expressed the regrets of the Association that the Hon. Henry C. Wallace, Secretary of the United States Department of Agriculture, was unable to be present to deliver the opening address. Dr. Munce proceeded immediately to deliver his address, which was an important feature of the program, especially on account of the constructive recommendations by one who has given much study to the aims and policies of scientific organizations and who has the future welfare of the United States Livestock Sanitary Association deeply at heart.

The members of the Program Committee are deserving of much praise for the excellent, well-balanced program which they arranged. It was necessary to pass two important num-

bers on account of the absence of Dr. E. C. Schroeder and Dr. A. Eichhorn. Dr. Schroeder was unable to attend the meeting on account of the death of his mother, and Dr. Eichhorn was detained at home to care for his wife who was injured in an automobile accident. All the addresses were of unusual merit.

The reports indicated that the members of the various committees gave careful study to their subjects and much care in the preparation of their material. These reports contain much information and many suggestions of interest to veterinarians who have not yet joined the Association as well as the members. For instance, the Committee on Tuberculosis recommended in its report that 15 per cent of the Federal appropriation for indemnifying owners for reactors be used to pay for cattle tested and condemned by accredited veterinarians.

In connection with the proceedings, the Chicago Live Stock Exchange gave a banquet on Thursday evening, December 7, at the Chicago Athletic Club, at which tuberculosis eradication was discussed. The livestock exchanges, the Institute of American Meat Packers, State regulatory authorities, farm bureaus, breeders and the Bureau of Animal Industry were represented at this banquet. The reports on the progress of the work in the various States were very encouraging. The spirit displayed by all concerned indicates that livestock owners desire the elimination of the disease from their herds as soon as possible, and future progress will depend upon the action of State legislatures and the National Congress in providing funds to carry on the work.

The weather was favorable for the meeting. It is estimated that 500 veterinarians and others were present. Notwithstanding the many attractions at the international livestock show, all of the sessions were well attended. "We are having a fine meeting," was a salutation frequently heard when old friends met in the lobby of the hotel, and it expresses the universal opinion of those who were present.

Dr. W. J. Butler, State Veterinarian of Montana, was elected President for the ensuing year; Dr. J. G. Ferneyhough, Richmond, Va.; Dr. J. H. Mercer, Topeka, Kans.; Dr. Benj. T. Davis, Cheyenne, Wyo.; Dr. A. W. Miller, Washington, D. C.; and Dr. W. K. Lewis, Columbia, S. C., were selected as Vice-Presidents, and Dr. O. E. Dyson succeeded himself as Secretary-Treasurer.

COLORADO VETERINARY MEDICAL ASSOCIATION

The next meeting of the Colorado Veterinary Medical Association will be held at the rooms of the Gentlemen's Riding and Driving Club, 1525 Curtis Street, Denver, Colorado, on Wednesday and Thursday, January 17 and 18, 1923.

I. E. NEWSOM, *Secretary.*

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The fortieth annual meeting of the Pennsylvania State Veterinary Medical Association will be held in Cameron Hall, Second and Walnut Streets, Harrisburg, Pennsylvania, January 23-24, 1923.

The Pennsylvania State Veterinary Medical Association is a member of the Allied Agricultural Associations of the Keystone State and its meetings are held in conjunction with the other agricultural organizations during Agricultural Week. This practice brings the practitioners into intimate contact with the livestock owners of the State, and has proven of great value in placing the relationship between the veterinary profession and the livestock industry on its proper basis.

This year's program has been arranged to include subjects of interest to all practitioners, whether they are especially interested in equine, bovine, porcine or small-animal practice, including poultry practice. Good, practical papers, presented by practitioners, are included in the program and good, live discussions are assured.

All veterinarians are invited to attend the Pennsylvania meeting and a special invitation is extended to all practitioners of the State, whether they are members of the association or not.

R. M. STALEY, *Secretary.*

FLORIDA STATE VETERINARY MEDICAL ASSOCIATION

The Florida State Veterinary Medical Association held a meeting in Jacksonville at the Aragon Hotel on November 22. The most important business coming up before the association was a discussion of a veterinary practice act for this State. Such an act was tentatively drawn up by a committee ap-

pointed for this purpose, and it is hoped that the next legislature will enact a law regulating the practice of veterinary medicine in the State of Florida. The following officers were elected for the ensuing year: Dr. T. J. Mahaffy, Jacksonville, President; Dr. J. V. Knapp, of Tallahasee, Vice-President; Dr. A. L. Shealy of Gainesville, Secretary-Treasurer. The next meeting will be held in Palatka in March in connection with the State Sanitary Association meeting.

A. L. SHEALY, *Secretary.*

DALLAS-FORT WORTH VETERINARY MEDICAL SOCIETY

The initial meeting of the Dallas-Fort Worth Veterinary Medical Society was held on the evening of October 23. A nucleus for the society was formed by a number of graduate veterinarians who gathered at the offices of the Livestock Sanitary Commission of Texas, Ft. Worth, for the expressed purpose of organizing for the interests of both the veterinary profession and the livestock industry. The meeting was presided over by Dr. Leon G. Cloud, State Veterinarian. Temporary officers were elected, committees appointed and other matters taken up which were essential in perfecting the organization. Several of those present made short talks in which they stressed the importance and need of graduate veterinarians in the vicinity of Dallas and Ft. Worth forming a society. It was the general consensus of opinion that the organization should be one in which veterinarians would be benefited, regardless of whether they were engaged in large or small animal practice, bureau, State or municipal inspection, laboratory work or in the commercial field, and that each member with his specialty could be useful to the society.

On Thursday evening, November 23, following a luncheon at the Oriental Hotel, Dallas, the second meeting was called to order. The first business before the house was a report from the committee on constitution and by-laws. Dr. H. L. Blackburn, chairman of the committee, presented a very complete report. After a thorough and somewhat lengthy discussion of the proposed constitution and by-laws it was voted that the instruments with some few minor changes be adopted. A code of ethics was also read and adopted.

The election of permanent officers was next taken up, which resulted in the election of Dr. Leon G. Cloud, Ft. Worth, President; Dr. A. E. Flowers, Dallas, First Vice-President; Dr. S. G. Bittick, Ft. Worth, Second Vice-President, and Dr. W. R. McCuistion, Ft. Worth, Secretary-Treasurer.

A rising vote of thanks was extended to the entertainment committee, for the splendid luncheon and the arrangement for a place of meeting, and to the committee on constitution and by-laws in respect to their labors.

Thirty-nine veterinarians signed the constitution and several applications for membership will be considered at the next meeting, which will be held the first Thursday in January, at Ft. Worth.

COMMITTEE ON PUBLICITY.

MINNESOTA VETERINARY MEDICAL ASSOCIATION

The next meeting of the Minnesota State Veterinary Medical Association will be held in Minneapolis at the Radisson Hotel, on Wednesday and Thursday, January 10 and 11, 1923. An interesting and instructive program is being prepared, and a large attendance is anticipated.

C. P. FITCH, *Secretary.*

FOREIGN COUNTRIES REQUEST LIVESTOCK PICTURES

A series of 10 pictures showing various kinds of types of livestock recently issued by the United States Department of Agriculture is in demand principally by schools, banks, and livestock officials in the United States, but is also going to foreign countries. Among recent requests for the pictures are those received from Norway and Sweden. The series show beef and dairy cattle, horses, mules, swine, sheep, goats, and poultry. Each picture measures 11 by 15 inches and is suitable for wall use or general display by veterinarians.

The display of such pictures in foreign countries will be of assistance in acquainting persons who may see them with the excellent types of livestock raised in the United States and available for purchase by foreigners. The main purpose of the pictures, however, is to encourage the improvement of livestock in this country by the use of better sires.

COMMUNICATION

ANDREW SMITH MEMORIAL FUND

To the Editor:—

I am enclosing herewith a statement to date of the Andrew Smith Memorial Fund, of which I am treasurer. I have thought that if you could find space to insert this in one of the issues of the Journal it might result in more subscriptions being received.

We are anxious to get at least $5,000 for this fund and all subscriptions should be forwarded to me here.

If you could do me this favour it would be very much appreciated.

Yours sincerely,

George Hilton,

Ottawa, Canada.

Receipts.

Nov. 5, 1922—Total subscriptions	$760.55
" " " —Canadian Exchange	22.33
" " " —Interest on bonds	37.12
" " " —Bank interest	4.62
	$824.62

Disbursements.

Nov. 7, 1921—Three Victory Bonds ($100)[1]	$291.72
Jan. 10, 1922—Five Victory Bonds, (one for $100 and four $50 bonds)	299.56
May 1, 1922—One Victory Bond ($100)	100.00
Sept. 19, 1922—One Victory Bond ($50)	51.06
Dr. Merillat's expenses	41.00
Bank balance	41.28
	$824.62

[1] All bonds are paying interest at the rate of 5½ per cent, per annum.

NECROLOGY

Dr. William A. Schaffter, a veterinary inspector in the Bureau of Animal Industry, died suddenly in his room on the morning of October 28 at Elizabeth City, North Carolina.

Dr. Schaffter was born in Wayne County, Ohio, September 27, 1876. He attended the Veterinary Department of the Ohio State University for two years and graduated from the Chicago Veterinary College in 1905. He then engaged in the practice of his profession being associated with Drs. Merillat and Wright, Chicago, Ill. In 1910 he moved to Mansfield, Ohio, where he continued in practice, but in 1918 he was compelled to go to Colorado on account of the ill health of his wife. Mrs. Schaffter died in 1920. In August, 1921, Dr. Schaffter was given an appointment in the bureau and was assigned to hog cholera control work in North Carolina, with headquarters at Elizabeth City. He was a brother of Dr. E. P. Schaffter, inspector in charge of Federal meat inspection at Detroit, Mich.

Mrs. O. E. Troy, wife of Dr. O. E. Troy of Raton, N. Mex., passed away November 13, at the Miners Hospital from peritonitis. Mrs. Troy became the mother of a fine baby boy on November 6, and her condition was believed to be entirely favorable to recovery up to a short time before her passing. The child is reported hearty and well.

Alvina Postel (Troy) was born at Mescoutah, Ill., April 14, 1896, and was brought by her parents in the same year to Albuquerque, N. M. She received her education at the public schools and the high school at Albuquerque, at a girls' seminary in Monticello, Ill., and at a normal school in Chicago, where she specialized in physical culture. Later she engaged in physical training work for four years in schools at Dallas and Port Arthur, Texas. She was united in marriage to Dr. O. E. Troy of Raton in January, 1922, the honeymoon being spent in an extended tour of the Hawaiian Islands. Since returning their residence has been in Raton and upon the Troy ranch southeast of the city.

Besides the husband and the little one, Mrs. Troy leaves surviving her her parents, Mr. and Mrs. Andrew C. Postel of Albuquerque, and one sister, Miss Paula Postel, St. Johns, Mo.

The sad circumstances of Mrs. Troy's passing have aroused deep sympathy for the bereaved husband from his many friends.

MISCELLANEOUS

CHRISTMAS IN THE STABLE

By T. P. White, *Washington, D. C.*

On Christmas night when the bells delight,
  And good will to man beseech,
As years are old the legend is told
  That the quadrupeds have speech.
At twelve o'clock by the crow of the cock,
  In the stables o'er the land,
From lips ere dumb there is heard a hum—
  A babble of voices bland.

Said bossy cow, as she made her bow,
  "I am sure you'll not deny,
Though to your ear it may sound quite queer,
  There is none so useful as I.
My muscles make tender, juicy steak,
  And my hide for shoes they tan;
My milk and cream daily flow in stream,
  For the food of babe and man."

Said grunty pig, "I don't care a fig,
  What the rest of you may say,
I am the beast that graces the feast
  On this bright and festive day.
A morsel sweet from my head to feet,
  I create new appetite;
My tender flesh either cured or fresh
  Is my master's chief delight."

And wooly sheep, as he woke from sleep,
  Lent his voice in self praise, too.
Said he, "My breed is a pride, indeed,
  Wether, lamb, or buck or ewe.
'Tis positive that threefold I give,
  In leather, in clothes, in meat.
So I contend I am man's best friend,
  'Tis a fact they oft repeat."

Then spoke old bay, with a gentle neigh,
As he shook his halter rope,
"You've all made claim to some valued fame,
And you're satisfied, I note.
Now list to me, since our words are free,
While a tale to you I tell,
Then without grudge I will let you judge
As a friend why I excel.

"Here I was born on a summer morn,
And the scent of new-mown hay
Came floating by as I cast an eye
On a wonder world that day.
The seasons flew and I quickly grew
To a sound and prancing steed,
And far and wide o'er the countryside,
Not a match had I in speed.

"A lad as kind as e'er one will find,
'Twas my destiny to serve.
Each slight command of his voice or hand
Tingled through my blood and nerve.
I set the pace for many a race
Through the vale and o'er the hill,
A rapid clip without spur or whip
'Neath a rider's guiding skill.

"He hummed a song, I cantered along,
On an autumn morning fair;
My well-shod feet in rhythmic beat,
My nostrils wide to the frosty air.
A sudden alarm, a tightened arm,
An anxious halt, a listening ear,
And clear and plain it was heard again
A desolate cry of fear.

"A leap, a bound, at that distress sound,
There's a human life at stake.
With a vim and dash I'm off like a flash,
A maddened beast we must overtake.

A whispered cheer as I gallop near,
A gentle urge and a final spurt,
The race is won, and the gallant task done,
And a maiden smiles, unhurt.

"A single glance kindles love's romance,
So the fates do oft foretell.
A courtship gay and a wedding day
Brought the maiden here to dwell.
And since that time when the carols chime,
On this night of cheerfulness,
I, too, rejoice in my humble voice,
In my master's happiness.

"I must take heed of the hour's speed,
So my story's to an end.
Please signify if I qualify
To be man's most faithful friend?"
Thus asked old bay—but there's no gainsay,
For the time of speech was spent;
And from the herd not a sound was heard,
So their silence gave assent.

CONTROL OF SHEEP STOMACH WORM

By G. H. LAMSON, JR.
Zoologist, Storrs Agricultural Experiment Station, Storrs, Conn.

THE experiments in the control of the stomach worms of sheep carried on for the last three years have culminated by finding that nicotine sulphate is an effective vermicide for this parasite. Nicotine for a long time has been found to be efficient when given in the food, as tobacco stalks, stems, leaves, and dust. Tobacco dust has been steeped in water and the decoction made has been found to kill the stomach worms. The tobacco dust, however, varies greatly in respect to the nicotine content, and for this reason a staple standardized solution has been sought. It has been found that nicotine sulphate, commonly sold under the name of "Black Leaf 40," added to water made a solution of uniform strength. This has been found to act more efficiently

than the copper sulphate treatment in the experiments at Storrs.

It was easy to procure, easily made, it was cheap, and did not have the prolonged after-effects that the copper sulphate and some other vermicides showed.

The nicotine sulphate can be used in one of three strengths, namely by adding one teaspoonful of "Black Leaf 40" to a quart of water and giving four ounces of this to an adult sheep, and two ounces to a lamb over three months old; or adding two teaspoonfuls to the quart; or three teaspoonfuls to every quart. One teaspoonful strength is used only for weak animals. Two teaspoonfuls could be used for the average sheep and lambs, while three teaspoonfuls could be given to strong animals. In the instances where three teaspoonfuls have been used, few, if any, worms have been left alive in the stomachs of sheep and lambs. Where two teaspoonfuls to a quart were used, it was found that the efficiency was high. One teaspoonful to a quart was sufficient to kill a very large number of the worms, and prepared the animal to gain strength so that later stronger solutions could be given a month or two thereafter. Treatments cost less than a half-cent a dose.

Animals were drenched in the same manner as with copper sulphate and were kept without food twelve hours previous to drenching. In order to have the dosage most effective, it is well to have them go at least eight hours, after drenching without food or water. The treatment should be repeated every three months to an advantage in the average flock. Dosing the sheep with one ounce of Epsom salts and keeping them confined two days after dosing, then placing them on a new pasture greatly reduced the chance for heavy new infection. Over a thousand sheep have been drenched with nicotine sulphate, and only five weak animals have died from the effects of the drenching. One hundred and sixty-five stomachs have been opened and inspected to determine the efficiency of these tests.—*Bulletin of Immediate Information, Storrs Station.*

PASTEURIZE CREAMERY BY-PRODUCTS

There has been considerable discussion and publication recently relative to the pasteurization of skim milk, whey and buttermilk returned from creameries to be fed to hogs in the State of Wisconsin. Our readers will be interested in the following state-

ment by Mr. C. P. Norgord, Commissioner of Agriculture, Madison, Wisconsin:

"The Wisconsin Experiment Station investigated the spread of tuberculosis from creameries in Dane County to herds of patrons. They compared the spread of tuberculosis by creameries where milk was separated and the skim milk sent back to different farms with those where the milk was separated on the individual farms. In the creameries that separated, the percentage of tuberculosis was 34.5, while in eight other creameries that did not separate, the percentage was 8.5. It stands to reason that the milk from a highly infected herd containing a heavy seeding of tubercle bacilli is distributed throughout the milk, skim milk and whey coming from all other herds. When the farmers take home their skim milk or whey, therefore, they also take home with them in this product a seeding of tuberculosis germs originating from the infected farm. As a consequence, the hogs and calves drinking the skim milk or whey become infected and often the entire herd of cattle and hogs becomes tuberculous."

The condition prevails in some other States, the same as in Wisconsin and there has been a continuous increase of tuberculosis in swine in these States. Although these States have pasteurization laws, they are observed more in the breach than in the enforcement. Inasmuch as it will take many years to reduce bovine tuberculosis in some States to a degree that will cut down the percentage of swine tuberculosis, it will be highly advisable to see pasteurization practiced as extensively as possible at creameries and other dairy stations from which products are sent back to the farm.

LIME AND PHOSPHORUS ARE VITAL TO DAIRY ANIMALS

Lime and phosphorus, although they are found in relatively small quantities in feeds, have a great deal to do with milk production and building up the body of the unborn calf. If the cow does not have enough of these elements in her ration she will draw on the supply in her body for a time, and heavy producers commonly do this. Therefore, it is a good practice to feed cows well when they are running low in milk yield and when they are dry, so that they may store up these elements as

well as others in their bodies for use when the large demand is made.

The common view is that dry cows need only enough feed for maintenance, but experiments have shown that this is not true. The cow is a milk-manufacturing plant, and, like many factories, she must have a reserve supply of materials to draw on when heavy demands are made. A cow that has been well fed when dry and has stored up this reserve is able to produce more on full feed than a cow that was given only a maintenance ration during that resting period. In this way a cow can utilize her capacity the year round, although she may not be giving milk all the time.

In keeping up the necessary lime and phosphorus supply it is well to keep in mind the fact that certain feeds are richer than others in these elements. The feeds which contain the most lime are the legume hays, which include cowpea, alfalfa, soy bean, the clovers, and some others. Of those mentioned cowpea hay contains the most lime, and the others are named here in the order of their richness in lime. The lime content of hay depends to a great extent on its quality. Leafy alfalfa hay contains more lime than coarse, stemmy hay.

The common dairy feeds that contain the most phosphorus are wheat bran, cottonseed meal, standard wheat middlings, and linseed meal, in the order given. Less common feeds that are high in phosphorus are, in order, sesame-oil cake, rice polish, buckwheat middlings, rice bran, sunflower-seed cake, rapeseed cake, buckwheat bran, and malt sprouts.

No grain or other concentrate contains anywhere near so much lime as the legume hays; and no kind of roughage contains phosphorus in quantities comparable to those found in the concentrates mentioned above. Grass hays, corn silage, and corn products with the possible exception of those made from the germs are low in both lime and phosphorus.

USE AMPLE SUPPLY OF PURE MILK FOR SCHOOL CHILDREN

Now that milk is served in many public schools throughout the country, milk and dairy inspectors should make frequent visits to the schools to see that the product is of good quality when delivered and that it is handled and served to the children in a sanitary manner. Inspectors in those cities where milk is

not served in the schools should advocate the adoption of the plan.

One of the duties of the inspector is to see to it that the milk does not stand for some time before being used. A good plan is to have it delivered just at lunch time, or, if this is not convenient, to see that there are facilities for icing and storing it. By taking samples at frequent intervals a close check can be kept on the methods of handling.

Milk for use at schools should always be put up in bottles to reduce the chances of contamination. Before the bottles are opened the tops should be thoroughly washed. Because glasses and cups may not be kept clean, it is best for the milk to be drunk directly from the bottle. Some dairies use special protective caps on bottles of milk sent to schools.

ARAB HORSE TEST IN ENGLAND

The Arab Horse Society of England recently held its third Arab horse endurance test. Under the conditions of the competition the distance to be covered was sixty miles a day for a period of five days. Nine hours were allowed for a day's journey, a minimum of seven hours being fixed for the first three days. An hour's stoppage during the day was compulsory, this being subdivided into two periods of ten minutes each and one of forty minutes. The weight to be carried was 13 stone (182 pounds), and no stimulant of any kind was permitted. The contest was won by Shahzada in 37 hours and 29 minutes (exclusive of compulsory stops). This horse was the lightest in weight of those entered, while the second horse, Shwaiman, was the heaviest.

BRITISH VETERINARIANS GO TO LAW

British veterinary circles have been stirred by a lawsuit for damages for slander, brought by Sir John McFadyean, Principal of the Royal Veterinary College, London, against J. C. Coleman, a veterinarian of Swindon. The action grew out of criticism at a veterinary association meeting by Mr. Coleman of Sir John's alleged policy of offering tuberculin directly to cattle owners, with the expectation that they would choose their own veterinary practitioners to make the tests. The trial before a judge and jury resulted in a verdict for the defendant.

BRITISH VETERINARIANS HOLD SUCCESSFUL CONVENTION

The fortieth annual meeting of the British National Veterinary Medical Association, which was held at Bath last August, appears to have been an unusually interesting and successful gathering. The membership showed an increase from 1,115 to 1,362 during the preceding year.

Dr. O. Charnock Bradley was succeeded as President by Mr. Henry Sumner. Dr. Bradley's presidential address dealt in vigorous fashion with three problems of great present interest and importance to our British colleagues, "Salaries, Education and Research." Mr. Sumner in advocating further professional advancement said: "It is up to our younger men to take opportunities of training such as will fit them to be confrères of the best men that the medical profession can turn out."

The Mayor of Bath was especially happy in his address of welcome and in his address at the annual dinner. Some of his witty remarks will bear quoting:

"The ordinary medical man can ask his patient what is the matter, but the veterinary surgeon has to ask himself what is the matter with his patient—which is a very different thing. A physican can put his mistakes underground. A veterinary surgeon sometimes lives to eat his own errors.

"Since the Government imported mules into this country, I am told that the insurance premiums upon the lives of veterinary surgeons, and for accidents which may befall them, have considerably increased. A mule is always sure-footed, especially with his hind foot. I am told that every person living who drove a mule team in the late war is drawing a pension, in most cases 80 per cent unfit. The average veterinary surgeon takes all these risks, and he is very badly paid."

A number of the veterinarians in Detroit take an active interest in the transactions of the Detroit Section of the Society of American Bacteriologists. At the September meeting the subject of "Actinomycosis" was presented by Dr. Donald C. Beaver, and at the November meeting Dr. H. Preston Hoskins read a paper entitled, "The Preparation and Standardization of Anti-Hemorrhagic Septicemia Sera."

Dr. R. M. Quigley, of Tyrone, Pa., was recently called to mine-guard duty with the 104th Cavalry, N. G. P.

The marriage is announced of Miss Harriet C. Rutherford, of Willow Grove, Pa., to Dr. Frank E. Lentz, of the Veterinary Faculty, University of Pennsylvania.

Dr. William N. Berg has resigned his position as pathological chemist in the Pathological Division of the B. A. I., and is now engaged in the manufacture of biological products at the Berg Biological Laboratory, Brooklyn.

Dr. Charles V. Noback is enjoying a well-earned vacation in the United States after spending several years as Director of the Laboratorio de Higiene, Bogotá, Colombia, South America. He is at present visiting friends in Minnesota but his temporary address while in this country will be 215 Crotona Parkway, The Bronx, New York City.

A dispatch from Helsingfors, Finland, quotes a Russian soviet publication as announcing that the bolshevist authorities in one of the districts ravaged by famine have shot 117 children "for sanitary and humanitarian reasons," because they were affected with glanders following the consumption of the meat of glandered horses.

The veterinary colleges at Utrecht, Netherlands, and Stockholm, Sweden, both of which were founded in 1821, have celebrated their centenaries. To commemorate the occasion each institution issued a handsomely illustrated booklet containing historical and other information. These schools have made notable contributions to veterinary education.

During a very hot spell a man was riding in his Ford with one foot hanging out over the door. A small boy noticing this shouted after him: "Hey, Mister! Did you lose your other roller skate?"—*Harper's Magazine.*

According to *Everybody's Magazine*, the following sign appears near Stoneham, Mass.: "All treepasters will be persecuted by the bull. Look and leave."

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

J. R. MOHLER, Editor, Washington, D. C.

Vol. LXII, N. S. Vol. 15. February, 1923 No. 5

A SLIGHT CHANGE IN OUR PLANS

IT HAS been found necessary to make a slight change in the plans for transferring the JOURNAL from Washington to Detroit, as announced in the January number. At the meeting of the Executive Board, held in Chicago, in December, sentiment was strongly in favor of having some officer of the Association attend every State association meeting held during the winter. The Secretary was instructed to attend a number of these meetings.

When it came to the actual work of arranging an itinerary that would permit attendance at these meetings, looking after the hundred and one details incident to leaving our old position and moving into the new quarters of the Association, employing office help and getting launched on our new duties, the inadvisability of attempting to get out the February issue from Detroit was only too apparent.

We appealed to the former Editor, Dr. Mohler, for help, with the result that he very kindly consented to get out this issue from Washington. By the time this number reaches its readers the March number will be well under way. It is our intention to get the JOURNAL in the mails by the twenty-second of each

month. This slight change in the plans will enable us to do this the more readily.

We take this opportunity to thank Dr. Mohler very kindly for his help in the present emergency, for his many thoughtful suggestions, and especially for his efforts to turn over to us a smoothly running machine. Our burden has been made materially lighter by his efforts in this direction. H. P. H.

NEW NAMES FOR OLD FRIENDS

THE LITERATURE of bacteriology and related branches of science has long been marked by confusion in the classification and names of bacteria. The classification was neither logical nor exact, and different names were applied to the same organisms by different writers. The Society of American Bacteriologists several years ago referred this problem to a special committee, whose final report,[1] which was adopted by the Society December 29, 1919, provides a basis for uniformity and precision, and, if generally followed, promises to bring order out of the confusion. The committee was composed of Dr. C. E. A. Winslow, editor in chief of the *Journal of Bacteriology,* Jean Broadhurst, R. E. Buchanan, Charles Krumweide, Jr., L. A. Rogers and G. H. Smith.

In the three years that have elapsed since this report was presented and adopted the new classification has been subjected to careful study and criticism and has met with increasing favor and recognition. It is logical, orderly and biologically sound. The new classification and terminology are being followed by the *Journal of Bacteriology,* the *Journal of the American Medical Association* and other scientific journals, and more and more by scientific writers. The latest edition of Buchanan's "Veterinary Bacteriology," reviewed elsewhere in this issue, has adopted them. No doubt other text-book writers will follow suit. The progressive veterinarian will wish to familiarize himself with the new forms, at least so far as they concern veterinary science.

An outline of the new arrangement is presented in the ac-

[1] The families and genera of the bacteria. Final report of the Committee of the Society of American Bacteriologists on Characterization and Classification of Bacterial Types. Jour. Bact., vol. 5, no. 3, May, 1920, p. 191.

companying table. The Schizomycetes are divided into five orders, only the last two of which are of special concern to the bacteriologist. These two orders are subdivided into eight families, twelve tribes and thirty-eight genera. Names of many of the previously established genera and of most of the species have been retained. In some of the names of species the necessary changes in termination to conform to the accepted Latin style have been made. A list of old and new names of the commoner organisms is appended to the committee's report.

To the veterinarian the most noticeable changes are those resulting from what the committee characterizes as "the breaking up of the absurdly incongruous aggregates massed together under the older names Bacillus and Bacterium." These genera are now much more restricted than formerly. The family Bacillaceae comprises all the spore-bearing organisms, the aerobes being placed in the genus Bacillus and the anaerobes in Clostridium. The genus Bacterium no longer includes spore-bearing aerobic organisms but is limited to nonsporulating, Gram-negative rods possessing other minor characteristics.

Some examples will show how old familiar friends have taken on new names. *Bacillus tuberculosis* has become *Mycobacterium tuberculosis*. The blackleg organism, formerly *Bacillus chauveaui*, is now *Clostridium chauveaui*. Bang's *Bacillus abortus* became *Bacterium abortum*, and the proposal has been made more recently to place it in a new genus, Brucella, along with *Bacillus melitensis* and one or two other closely related forms. *Bacillus nechophorus* is changed to *Actinomyces necrophorus*. *Vibrion septique*, a French term applied by Pasteur in the dawn of bacteriological science, is transformed and Latinized into *Clostridium septicum*. *Bacillus botulinus* is just as deadly as ever under the new name of *Clostridium botulinum*. The glanders organism, *Bacillus mallei*, becomes *Pfeifferella mallei*. The causative agent of swine erysipelas, previously *Bacillus erysipelatis suis*, takes the name *Erysipelothrix porci*. The hemorrhagic septicemia or Pasteurella group is now formally placed in the genus Pasteurella. *Bacterium anthracis* reverts to *Bacillus anthracis*, while *Bacillus coli* becomes *Bacterium coli*.

The new classification is not intended to be absolutely final, but is subject to further modification with the increase of knowledge. That it is a step in the right direction seems no longer

OUTLINE OF NEW BACTERIAL CLASSIFICATION AND NOMENCLATURE

CLASS SCHIZOMYCETES

Order	*Family*	*Tribe*	*Genus*
Myxobacteriales			
Thiobacteriales			
Chlamydobacteriales			
Actinomycetales	Actinomycetaceae		Actinobacillus
			Leptotrichia
			Actinomyces
			Erysipelothrix
	Mycobacteriaceae		Mycobacterium
			Corynebacterium
			Fusiformis
			Pfeifferella
Eubacteriales	Nitrobacteriaceae	Nitrobactereae	Hydrogenomonas
			Methanomonas
			Carboxydomonas
			Acetobacter
			Nitrosomonas
			Nitrobacter
		Azotobactereae	Azotobacter
			Rhizobium
	Pseudomonadaceae		Pseudomonas
	Spirillaceae		Vibrio
			Spirillum
	Coccaceae	Neissereae	Neisseria
		Streptococceae	Diplococcus
			Leuconostoc
			Streptococcus
			Staphylococcus
		Micrococcceae	Micrococcus
			Sarcina
			Rhodococcus
	Bacteriaceae	Chromobactereae	Erythrobacillus
			Chromobacterium
		Erwineae	Erwinia
		Zopfeae	Zopfius
		Bactereae	Proteus
			Bacterium
		Lactobacilleae	Lactobacillus
		Pasteurelleae	Pasteurella
		Hemophilaeae	Hemophilus
	Bacillaceae		Bacillus
			Clostridium

open to doubt. Some time will be required to accustom ourselves to the new nomenclature. It will come hard to some of us to cease referring glibly to the familiar "B." this, that and the other, and instead to say or write such strange forms as Clostridium, Pfeifferella and Erysipelothrix. But the effort is the price of progress and good order. We might as well become reconciled to the breaking of family ties and the changing of names among the interesting organisms whose ways and habits so vitally concern us.

MANY COUNTRIES STUDY ANTHRAX PREVENTION

A NUMBER of European countries are taking an active interest in preventing anthrax among workers in industries where they are particularly subject to this danger, according to Dr. M. Dorset, of the Bureau of Animal Industry, who recently returned from London, where, as an unofficial delegate, he attended the conference of the International Advisory Committee on the Prevention of Anthrax. The object of the committee, which is made up of members from England, India, Australia, South Africa, Italy, Sweden, Germany, France and Belgium, is to secure the adoption of protective measures in various countries and to find better methods of disinfecting wool, hides, skins, and hair.

England already has taken steps to protect her wool workers by putting up a large disinfecting plant at Liverpool at a cost of $750,000. The cost of operation is said to amount to about 3 cents a pound for the wool that goes through the process. So far no effective method has been devised for hides and skins that is not injurious to these products.

In the United States the number of deaths of persons from anthrax contracted in places where it might be prevented by disinfection is comparatively low. During the 8 years up to and including 1917, there were 222 deaths caused by this disease, and only 25 to 30 per cent of them of persons, such as wool workers and tannery employees, who might have been protected by treating the raw materials. Farmers and dock workers who handle wool, hides, and hair brought into the country can not be protected in this way.

About 20 per cent of the deaths just mentioned were of farm-

ers who, in most cases, contracted the disease as a result of skinning animals that died of an ailment at the time unknown. The farmer may protect himself by not attempting to salvage the hides of animals that have died from unknown causes.

In the past there have been occasional newspaper stories of men who have contracted anthrax through the medium of the shaving brush. As brushes made of horse hair are the most dangerous in this respect, brush manufacturers have voluntarily agreed to use no more horse hair in the making of shaving brushes.

At the London meeting it was decided that the English method of disinfecting wool is satisfactory, but that all countries concerned should try to develop a method that may be used on hides and hair without injury. The committee also recommended that a list should be compiled of countries from which wool, hides, hair, and similar products may be imported without the necessity of disinfection. It was suggested that in making up such a list there should be taken into consideration the number of cases of human anthrax in industries in the various countries, the occurrence of anthrax bacilli in the products concerned, and the precautions that are taken to prevent the spread of the disease among domestic animals.

FOOT-AND-MOUTH DISEASE IN GUATEMALA

A SERIOUS outbreak of foot-and-mouth disease in epizootic form has suddenly appeared in Guatemala. From the investigations made by the Guatemalan Ministery of Agriculture it would appear that the introduction of this dread disease into Guatemala is due to recent importations of cattle from the neighboring Republic of Honduras. Unfortunately, as is so frequently the case, the nature of the infection was not quickly ascertained, with the result that it has already spread over various parts of Guatemala. It is reported to exist in seven departments along the east coast and possibly in other departments on the Pacific Coast. While under the existing laws and regulations of this country cattle can not be permitted importation into the United States from Central American countries, cattle as well as other ruminants and swine may enter our country from Mexico and to a limited extent are being imported. As Guatemala adjoins

Mexico on the south and inasmuch as it is reported that cattle have been imported into Mexico from Guatemala by rail, it is to be hoped that our Mexican neighbors will be successful in keeping infection from their territory. Nevertheless it behooves the veterinarian of the United States located along the Mexican border to keep a careful lookout for foot-and-mouth disease, as our neighboring Republic of Mexico must be considered in a dangerous situation. We understand that information is being sought through official channels as to the extension of foot-and-mouth disease in Honduras and Guatemala, confirmation of diagnosis, action taken by those countries to prevent exportation of livestock to Mexico and measures adopted by the latter country against importation of animals from both Guatemala and Honduras.

PLANS FOR MONTREAL MEETING OF A. V. M. A.

President Welch has approved the selection of the following local committee on arrangements for the A. V. M. A. meeting at Montreal next August: Honorary chairman, Dr. F. Torrance; chairman, Dr. M. C. Baker; treasurer, Dr. G. A. Dauth; secretary, Dr. J. H. Villeneuve, 266 Craig Street East, Montreal, Quebec; members, Drs. G. Genereux, A. A. Etienne, F. T. Daubigny, L. A. Willson, H. Pilon.

This committee has already taken preliminary steps toward engaging satisfactory hotel accommodations and obtaining the attendance of some distinguished veterinarians from abroad. Sir Stewart Stockman, Chief Veterinary Advisor of the British Government, has promised to come, and it is hoped that the French Government will also send one or two representatives.

Old Dobbin had his faults, but you didn't have to pour hot water on him to get him started on a cold morning.—*Wall Street Journal.*

"Look out for my horse; don't park your car too near him."

"That's all right. I know the regulation about not parking within fifteen feet of a plug."—*Washington Star.*

THE VETERINARY RESERVE CORPS [1]

By ROBERT J. FOSTER

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THE NATIONAL DEFENSE ACT of June 4, 1920, established a definite peace-time military policy for our country for the first time in its history. This law provides for the organization of our military forces into one harmonious, well-balanced and effective army, the Army of the United States, the component parts of which are the Regular Army, the National Guard when in the service of the United States, and the Organized Reserves, composed of the Officers' Reserve Corps and the Enlisted Reserve Corps.

An examination of the statute shows that the new law is based on the idea that in the future, as in the past, great wars are to be fought in the main by armies composed of citizen soldiers temporarily drawn into the military service. We still have the conception of a small Regular Army in time of peace, reinforced upon the outbreak of war by such additional citizen forces as the particular emergency may require. This is our traditional mode of military expansion, and this method is clearly contemplated in the act of Congress.

But whereas in the past the necessary citizen forces have been completely extemporized or materially reorganized upon the occurrence of an emergency, the new law provides that they shall be allocated territorially, that their officers and men shall be assigned to local units, and that as funds become available provision shall be made for the training of these officers and men. In other words, the war force required for immediate mobilization in the event of emergency is to be constituted in time of peace, and filled as far as practicable through the enrollment or enlistment of qualified volunteers. Under such a system it is reasonable to expect that the units of the National Guard will be maintained at sufficient strength to be effective as a first reinforcement for the Regular Army, and that the units of the Organized Reserves will at least include a corps of officers, noncommissioned officers, and specialists, organized and trained to re-

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

ceive and train the recruits required in an emergency demanding large forces.

The strength of the Organized Reserves is not fixed in definite terms but is left to the discretion of the President. However, the inference as to its strength is that it, together with the Regular Army and the National Guard, both at full war strength, shall be such as to meet the needs of complete and immediate mobilization in the event of a national emergency.

The force which has been fixed upon by the War Department for the complete and immediate mobilization is six field armies, with the appropriate General Headquarters Reserve units, the necessary coast defense units, and the units required for the Communications Zone and Zone of Interior, in all a force of upward of 2,000,000 men.

This force has been allotted to the three components of the Army of the United States, as follows:

To the Regular Army: The combatant elements of one field army, including a few of the corps, army and general headquarters reserve units.

To the National Guard: The combatant elements of two field armies, including certain corps, army and general headquarters reserve units.

To the Organized Reserves: The combatant elements of three field armies, with the remaining corps, army and general headquarters reserve units required for the complete mobilization.

The coast defense troops required to supplement those of the Regular Army have been assigned to the National Guard and Organized Reserves.

No assignment of Communications Zone or Zone of Interior units has been made for the reason that the number of such units is determinate only after the detailed plans for mobilization are completed.

The units allotted to the National Guard and the Organized Reserves for organization have been allocated to the nine corps areas on the general basis of military population, resulting in a distribution of two National Guard and three Organized Reserve infantry divisions to each corps area. The distribution of cavalry divisions is roughly one National Guard and two Organized Reserve divisions to each of the three army areas, with one National Guard cavalry division somewhat scattered.

The distribution of corps, army and general headquarters reserve units approximates to that of military population.

As an aid to understanding the manner in which this allotment of troops to the three components of the Army of the United States was made, it is well to have in mind the missions assigned to each in the general scheme of national defense. The mission of these three components of the Army of the United States, which should be clearly understood by all those interested in national preparedness, may be stated as follows:

The Regular Army:

1. To provide adequate garrisons in peace and in war for our overseas possessions.

2. To provide adequate garrisons for the coast defense within the continental limits of the United States.

3. To provide personnel for the development and training of the National Guard and Organized Reserves.

4. To provide the necessary personnel for the overhead of the Army of the United States, wherein the duties are of a continuing nature.

5. To provide an edequate, organized, balanced and effective expeditionary force, which will be available for emergencies within the continental limits of the United States or elsewhere, and which will serve as a model for the organization, discipline and training of the National Guard and the Organized Reserves.

6. The Regular Army is the first component of the Army of the United States in peace and war.

The National Guard:

1. In time of peace, to provide an adequate, organized and effective force, which will be available in minor emergencies for employment within the limits of the United States by the States or by the United States.

2. In time of war or major emergencies, when Congress has authorized the use of troops in excess of those of the Regular Army, to provide an adequate, balanced and effective component of the Army of the United States for employment by the United States without restrictions.

3. The National Guard is the second component of the Army of the United States in peace and war.

The Organized Reserves:

1. To provide a trained, organized and balanced force which may be readily expanded and developed into an adequate war

component of the Army of the United States to meet any major emergency requiring the use of troops in excess of those of the Regular Army and the National Guard.

2. The Organized Reserves are the third component of the Army of the United States.

3. The Regular Army and the National Guard may be employed separately or together in minor and in major emergencies, but the Organized Reserves constitute purely a war force and can be employed only in the event of a national emergency declared by Congress.

A cardinal consideration in the organization of the three components was that together they should contain all of the units and organizations required for a complete mobilization, avoiding the necessity of disrupting and reorganizing any after the emergency has occurred.

The fundamental relationship of these three components of the Army of the United States is shown in the chart.

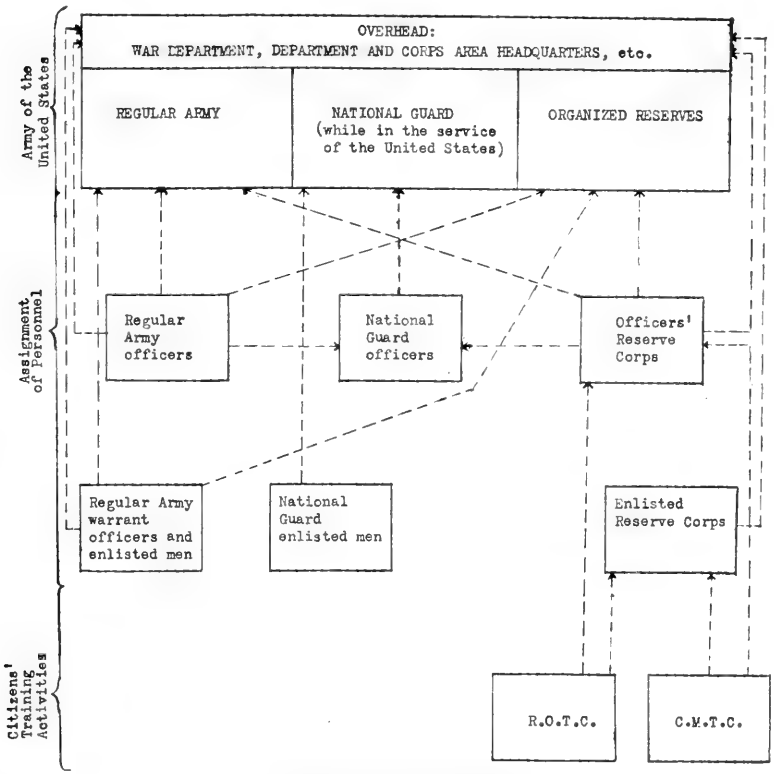

Chart showing organization of United States Army under National Defense Act of 1920

From this it is seen that the Army of the United States consists of four principal parts or components, viz: The overhead component, consisting of the War Department, the Corps Area and Department Headquarters and other activities of a continuing nature relating to the Army of the United States as a whole; the Regular Army combatant component; the National Guard combatant component, and the Organized Reserve combatant component. From the arrangement of the chart it is obvious that these components are coordinate, bearing an identical relation to each other and to the Army as a whole. In a word, these three components are merely echelons of the whole, designed to reinforce one another under stated conditions, but never intended to replace one another or to be used as replacements one for the other.

This chart also serves to show the manner in which personnel of one component may be assigned to the other components. For example, it shows that Regular officer personnel may be assigned to the overhead, to the Regular Army, and under certain conditions to the National Guard and to the Organized Reserves. It shows that an officer of the National Guard, as such, is eligible for assignment to the National Guard only, this for the reason that National Guard officers are only recognized and commissioned as such to fill definite vacancies in the National Guard organizations, and as long as they are filling such vacancies they are ineligible for other assignment. However, it is provided that a National Guard officer may also be commissioned in the Officers' Reserve Corps, and, in case of separation from the National Guard, becomes eligible, as a reserve officer, for assignment to the overhead, the Regular Army, or to the Organized Reserves.

Finally, this chart serves to show the manner in which the Reserve Officers' Training Corps and the Citizens' Military Training Camps have been linked up with the idea of the Army of the United States. Prior to the passage of the National Defense Act these activities existed as more or less independent and disassociated projects, but the provision for the Army of the United States contained in this act has made it possible to give both of these activities a definite place and function in the scheme of national defense. Briefly, as indicated by the chart, they are feeders to the Organized Reserves.

It is not purposed to dwell upon the Enlisted Reserve Corps, but simply to state that it consists of persons voluntarily en-

listed therein. The period of enlistment is three years, except in the case of persons who served in the Army, Navy or Marine Corps at some time between April 6, 1917, and November 11, 1918, who may be enlisted for one-year periods and who, in time of peace, shall be entitled to discharge within ninety days if they make application therefor. All enlistments in force at the outbreak of war, or entered into during its continuation, whether in the Regular Army or the Enlisted Reserve Corps, shall continue in force until six months after its termination unless sooner terminated by the President.

The President may form any or all members of the Enlisted Reserve Corps into tactical organizations similar to those of the Regular Army, similarly armed, uniformed and equipped, and composed so far as practicable of men residing in the same locality; may officer them by the assignment of reserve officers or officers of the Regular Army, active or retired, and may detail such personnel of the Army as may be necessary for the administration of such organizations and the care of Government property issued to them.

As a matter of fact, it is not contemplated that Organized Reserve units will, as a rule, ever be fully organized as to strength. On the contrary, the great majority of them will consist of cadres composed of the officers and noncommissioned officers and a few of the more important specialists. The Organized Reserves will thus be an organization in skeleton, composed of molds into which the draft will be poured for training. Thus organized, these cadres will meet all of the purposes of an organized reserve and at the same time will obviate the difficulties to be anticipated in trying to recruit them to full strength and in getting the money with which to assemble them for training.

While the Enlisted Corps section of the Organized Reserves will be limited to small units, or cadres, the War Department desires to organize fully the Officers' Reserve Corps.

The National Defense Act authorizes the organization of the Reserve Officers' Training Corps, the primary object of which is to provide systematic military training at civil educational institutions for the purpose of qualifying selected students of such institutions for appointment as reserve officers in the military forces of the United States.

Although the primary object of the Reserve Officers' Training Corps is to produce trained officers for the Officers' Reserve

Corps, it is recognized that the basic military training received by students, who for various reasons fail to complete their qualification course for the reserve corps, is of considerable military value to the Government.

The Reserve Officers' Training Corps will add to the educational resources of schools and colleges and will give to the student a training which will be as valuable to him in his industrial or professional career as it would be should the Nation call upon him to act as a leader in its defensive forces.

Graduates of the Reserve Officers' Training Corps may be appointed as reserve officers upon a satisfactory completion of the course of training prescribed by law and regulations. Commissions are issued only in the lowest authorized grade of the branch in which commissioned.

Today there are four Veterinary Units of the Reserve Officers' Training Corps, at the following schools, named in the order of their establishment: Kansas State Agricultural College, Manhattan; New York State Veterinary College at Ithaca (Cornell University); Ohio State University, Columbus, and Iowa State College, Ames. Fifty-nine graduates of these schools have been commissioned second lieutenants in the Veterinary Officers' Reserve Corps.

The law governing the appointment of officers in the Veterinary Corps, Regular Army, requires that the applicant hold a commission in the Veterinary Officers' Reserve Corps. Graduates of Veterinary Units of the Reserve Officers' Training Corps, commissioned as second lieutenants in the Veterinary Officers' Reserve Corps, constitute a pool from which those eligible are given the opportunity to take the examination for appointment in the Veterinary Corps, Regular Army.

In the future it is hoped that Veterinary Units of the Reserve Officers' Training Corps may be established at all State universities maintaining a veterinary department. One of the requirements is that a unit shall consist of at least 50 students, and, even though they are maintaining four classes, many of the veterinary departments are unable to comply. Then, too, the present Army appropriation bill provides for a Veterinary Corps of only 126 officers, and it may not be possible to spare more for detail with Reserve Officers' Training Corps units.

The National Defense Act also provides for Citizens' Military Training Camps to be conducted from time to time as appro-

priations therefor are available. In general, the program for training camps, in time of peace, will call for three courses of about one month's duration each. The first course is for elementary military training, the second course for training to qualify as noncommissioned officers of the Organized Reserves, and the third course for training to qualify as reserve officers. Entrance upon the officers' course is limited to those persons who upon termination of the camp will be eligible under the law for appointment in the section of the Officers' Reserve Corps in which they desire appointment and who possess the educational and general qualifications required of reserve officers. A certificate of graduation from the officers' course, showing the requisite military training, will, within two years of the date thereof, be accepted by an examining board as evidence of professional qualifications in those subjects covered by the certificate when the holder thereof is being examined for appointment in the Officers' Reserve Corps.

The National Defense Act authorizes appointments in the Reserve Corps of former officers of the Regular Army; of officers of the National Guard federally recognized; of warrant officers and enlisted men of the Regular Army, the National Guard and the Enlisted Reserve Corps; of persons who served other than as officers in the United States Army at any time between April 6, 1917, and November 11, 1918; of former officers of the World War; and of applicants who pass the required examination.

Veterinarians are chiefly concerned with the last three methods of appointment.

Any person who served other than as an officer between the dates named, who before discharge was recommended for appointment as an officer by the commandant of a training school or by a regimental or higher commander or other competent authority, may, until November 11, 1923, be appointed upon an examination of records and a physical, supplemented when necessary by a professional, examination.

Any person who served as an officer of the United States Army at any time between April 6, 1917, and June 30, 1919, may be appointed a reserve officer in the highest grade that he held in the Army, or in any lower grade. Until November 11, 1923, the examination for such appointment will consist of an investigation of the applicant's military record and a physical, supple-

mented when necessary by a professional, examination. Whether appointment should be made in the highest grade previously held or in a lower grade will be determined from the examination and the elapsed time since active service. After November 11, 1923, no appointments will be made based solely upon the records, and former officers will be examined and appointed under the provisions governing appointment by examination, that is, as if they had not been commissioned, and all appointments will be made in the junior grade.

APPOINTMENT BY EXAMINATION

To be eligible for examination, applicants must, in time of peace, fulfill the following conditions:

1. Be between 21 and 60 years of age and citizens of the United States or of the Philippine Islands.
2. Have at least a high-school education or its equivalent.
3. Have the following qualifications:

(*a*) Service as officers in the performance of duties pertaining to the branch for which examined, or, in the absence of such service, must, in the case of the Veterinary Officers' Reserve Corps, be graduates of reputable veterinary schools, qualified practitioners of the State in which they reside and engaged in the active practice of their profession.

In determining fitness for appointment, applicants are examined as to physical fitness, moral character, general fitness and professional fitness. The examination as to professional fitness is generally divided into two parts: Part A, basic military subjects, and Part B, special subjects applicable to the branch for which examined. The examination or any part thereof may be oral or written, or both. Practical problems and tests will be utilized so far as practicable.

ASSIGNMENT

Appointments in every case shall be for a period of five years unless sooner terminated. An appointment in force at the outbreak of war, or made in time of war, shall continue in force until six months after its termination, should the five-year period for which made terminate prior to that time.

Upon the expiration of the period of appointment, a reappointment without change of grade or section will, in general, be tendered without application.

An appointment tendered must be promptly accepted or declined. If acceptance or declination is not received within 60 days of the tender of appointment, same will be canceled.

In accordance with the provisions of section 5 of the National Defense Act as amended by the act of June 4, 1920, all policies affecting the appointment, assignment, promotion and discharge of reserve officers will be prepared by committees composed of officers of the War Department General Staff, at least half of whom are reserve officers. The policies outlined by these committees and approved by the Secretary of War constitute the approved policy of the War Department with reference to reserve officers. The personnel bureau of the Adjutant General's office will act on all matters relating to the appointment, assignment, promotion and discharge of reserve officers in accordance with such approved policies.

For administrative control each reserve officer is under the jurisdiction of the commander of the department or corps area in which his permanent residence is located. For training or assignment, or both, most, though not all, reserve officers are placed under the jurisdiction of department or corps area commanders. The term assignment, as used in reference to reserve officers, refers to an assignment or designation for a class of duty, or a specific duty for which it is contemplated to use the officer in time of emergency and for which it is contemplated he be trained in time of peace.

For purposes of assignment, reserve officers are divided into three groups:

(*a*) General Assignment Group.—The officers in this group are selected by the War Department and are for assignment to special duties and activities which, in time of peace or war, are not included in the jurisdiction of chiefs of branches or of territorial commanders who function in time of peace. The selection and assignment of such officers and the scope of duties they are to perform will be covered by instructions of the Secretary of War issued from time to time. For convenience of reference this group will be referred to by the abbreviation G. A. Group.

Officers will be placed in and removed from the G. A. Group by the Adjutant General of the Army, upon the request of the chief of the activity for which their services are desired to be reserved, in accordance with approved policies.

The names of officers in the G. A. Group and their assignments

will be recorded in the personnel bureau, Adjutant General's Office. The chief of this bureau will cause the records to be kept in such form as will facilitate the prompt issuance of orders regarding these officers in case of emergency, and will cause the chief of the branch in which the officer is commissioned, the commander of the department or corps area in which he resides or is stationed, and the chief of the activity for which he is reserved to be notified of the placing in or the removal of any officer from the G. A. Group.

The chief of the personnel bureau, Adjutant General's Office, will cause each officer of the G. A. Group to be notified of his assignment.

(*b*) Branch Assignment Group.—The officers of this group are selected by the chiefs of branches and are for assignment by those chiefs to special duties and activities pertaining to the various branches. For convenience of reference this group will be referred to by the abbreviation B. A. Group.

Officers will be placed in and removed from the B. A. Group by the Adjutant General of the Army upon the request of the chief of the branch concerned, in accordance with approved policies.

The names of officers in the B. A. Group and their assignments will be recorded in the appropriate offices of the several chiefs of branches, who will cause the records to be kept in such form as will facilitate the prompt issuance of orders regarding these officers in case of emergency.

The chief of the branch will cause each officer of the B. A. Group pertaining to his branch to be notified through the department or corps area commander of his assignment.

(*c*) Territorial Assignment Group.—This group includes all reserve officers not included in the G. A. Group or the B. A. Group. Such officers are available for assignment by department or corps area commanders to any organization or activities within their territory, not exempted from their control by specific orders of the War Department. Assignment may be made to any of the components of the Army, except that assignments to the Regular Army and the National Guard will be made only as specifically authorized by the War Department. In order to adhere as closely as possible to the principle of the localization of units of the Organized Reserves, department and corps area commanders are authorized to attach officers to appropriate units

in excess of the strength prescribed by Tables of Organization. For convenience of reference this group will be referred to by the abbreviation T. A. Group.

Officers will be placed in and removed from the T. A. Group by the Adjutant General of the Army in accordance with approved policies.

The department or corps area commander is responsible for the assignment of officers in the T. A. Group pertaining to his department or corps area.

The department or corps area commander will notify each officer of the T. A. Group, pertaining to his department or corps area, of his assignment.

As a basis for suitable assignment, all reserve officers will, upon appointment, be initially classified by the chiefs of branches, and by the Surgeon General in the case of Veterinary Reserve officers. All available records will be used in this classification and all data having a bearing upon the officer's availability and suitability for assignment will be recorded on an abstract of record card. Upon completion of the initial classification the abstract of record cards will be filed and kept up to date as follows: G. A. Group, in the personnel bureau, A. G. O.; B. A. Group, in the offices of chiefs of branches; T. A. Group, at the headquarters of departments and corps areas.

ACTIVE DUTY

Active duty for reserve officers is of two general classes—active duty in a national emergency declared by Congress, and active duty in time of peace.

In time of a national emergency expressly declared by Congress, the President may order reserve officers to active duty for indefinite periods without their consent. For this duty some reserve officers will be needed before others. The preference of an officer for immediate or deferred call to active duty are taken into consideration in determining, in time of peace, his assignment for duty in an emergency.

In time of peace, reserve officers may be ordered to active duty for training, instruction or temporary duty, provided there are funds available for their payment specifically appropriated for this purpose by Congress. No reserve officer shall be employed on active duty in time of peace without his own consent, except that, if funds for their payment have been appropriated, they

may, without their consent, be placed on active duty for training and instruction not to exceed 15 days in any calendar year. So far as practicable, the personal desires of officers to be called to active duty will be considered when funds for training only a portion of the reserve forces in any year are available. Both in an emergency and at other times as much notice as circumstances permit will be given officers prior to their call to active duty.

A reserve officer called to active duty for training purposes during any calendar year and upon whom such duty, for business or other good reasons, would work a hardship, will, upon request, be exempted from such tour of duty.

Active duty other than for a 15-day training period may be for a course of instruction at a service school, for instruction while attached to the Regular Army, or for any duty of a temporary nature. No officer will be called for such duty without his consent. Applications or recommendations for such duty should be made to department and corps area commanders, who, under policies determined and announced by the War Department in accordance with annual appropriations, will be charged, in general, with the selection of the limited number of reserve officers, if any, to be placed on active duty. Requests not covered by announced policies will be forwarded by department and corps area commanders to the War Department.

A reserve officer when on active duty shall receive the same pay and allowances as an officer of the Regular Army of the same grade and length of active service, and mileage from his home to his first station and from his last station to his home, but shall not be entitled to retirement or retired pay. Pay status begins on the date that the officer officially complies with the order calling him to active duty and ends when he is relieved from active duty. In time of peace an officer relieved from active duty is entitled to pay during the actual time required to travel from his last station to his home, to be computed over the shortest usually traveled route.

TRAINING AND INSTRUCTION

The training and instruction of reserve officers divides itself broadly into two general classes—first, that received when they are called into active duty for that purpose, and second, that received or acquired through individual interest and effort in

the intervals between periods of active duty. The extent of training of the first class can not exceed 15 days per year, except with the consent of the individual reserve officer, and is further limited in practice by the funds available for pay and other expenses incident to active duty. Every effort should, therefore, be made to encourage the individual efforts of reserve officers while on an inactive status. To this end, corps area commanders will see that reserve officers within their jurisdiction are given every practicable assistance in their efforts at self-improvement and will employ the Regular officers and enlisted men allotted to them for duty with the Organized Reserves in the conduct of this instruction through conferences, correspondence and such other appropriate means as may be practicable under the circumstances. The instruction imparted to reserve officers assigned to units of the Organized Reserves, whether on active duty or by correspondence or other similar means in the intervals between periods of active duty, will be directed to the end of making them effective members of effective military organizations. Through proper guidance and encouragement of individual effort the limited time available for active duty can thus be utilized as the practical culmination of progressive individual work.

The maximum time that a reserve officer may be called to active duty for training in any calendar year is 15 days. Whether or not this maximum obligation is exacted in any year is dependent upon the appropriations for that year and individual desires. Training programs will be determined and announced annually when appropriations have been made. So far as practicable officers assigned or attached to units of the Organized Reserves will be called out for training with their organizations. Any reserve officer subject to active duty for this 15-day training period may, upon his application, be exempted from such active duty if he has served on active duty for any purpose during the calendar year for not less than 15 days, or if, for satisfactory reasons stated by him, it is established that such active duty would work a hardship in his case.

In addition to the annual 15-day training period, a limited number of reserve officers may with their consent be placed on active duty for longer periods for courses of instruction at service schools, or for duty with the Regular Army. The num-

ber and method of selection of officers for such training will be determined and announced annually, when appropriations have been made.

Department and corps area commanders are charged with the duty of making full use of any existing opportunities within their jurisdiction which will enable reserve officers to become acquainted with activities within the regular establishment and to receive any possible benefit or instruction therefrom. Reserve officers should be informed by local commanding officers of events of interest taking place at any camp, post or station near their place of residence, and invited and encouraged to attend. It is of special interest to all concerned that as many reserve officers attend drill, ceremonies, lectures, field exercises, etc., as conditions permit, and that they receive the maximum benefit therefrom.

Under instructions issued from time to time by the War Department, reserve officers may attend general and special service schools, except the United States Military Academy. The numbers, branch of the service, and geographical distribution of officers to attend these schools at any time will depend upon the funds and facilities available.

When facilities permit, reserve officers may, on their application, be attached to the Regular Army for training and instruction at their own expense and without being placed on active duty. Such applications should be made to department and corps area commanders, and will be granted when practicable. An officer so attached will remain on inactive status and at no expense to the Government, except in so far as the use of the necessary equipment is concerned. Should a reserve officer apply to be attached to an organization outside the jurisdiction of the department or corps area commander, such commander may make the necessary arrangements by direct communication with the commander under whose jurisdiction such organization is serving. All proper steps will be taken to avoid unnecessary expense for reserve officers who seek instruction under these circumstances to give them as much instruction as possible in the time available. The efficiency reports, as required to be rendered in case of active duty, will be rendered in all cases of voluntary inactive service with organizations of the Regular Army.

PROMOTION

The promotion system, in time of peace, for the Officers' Reserve Corps will be governed by the following general considerations:

(*a*) Rank and office are distinct. Officers are provided primarily to fill offices. The accompanying rank is merely that believed commensurate with the duties and responsibilities of the office. The primary requisite for the appointment or promotion of an officer is that he is capable of performing the duties and accepting the responsibilties of the *office* which he would fill.

(*b*) When an officer is eligible for promotion he may, upon his own initiative or upon inquiry from higher authority, signify in writing that he believes himself reasonably qualified for, and is ready to undergo, examination for promotion. Such statements will be sent through military channels to the department or corps area commander, appropriate recommendation being made by all offices through which the statement passes. Whether or not an officer will be examined will be determined by the department or corps area commander from a consideration of the statements of the officer concerned and the recommendations submitted, and whether there is a suitable assignment for the officer in the new grade.

For all sections of the Officers' Reserve Corps promotions may be made under the following conditions:

(*a*) The officer must signify his willingness and must be recommended to be examined for promotion.

(*b*) The officer must have served the prescribed minimum time in the grade from which promotion is contemplated.

(*c*) The officer must have satisfactorily passed his promotion examination.

(*d*) There must be an appropriate assignment or duty for the officer upon promotion.

To be eligible for promotion to any grade an officer must be credited with three years' service in the next lower grade, *one year of which must in every case have been in the Officers' Reserve Corps since November 11, 1918.* In computing the required three years' service in any grade there will be credited service in that grade in the Officers' Reserve Corps since November 11, 1918, and active service in the same or higher grade in any component of the United States Army between April 6,

1917, and December 31, 1920, double credit being given for such of the above active service as was rendered during the period of hostilities, *i. e.*, between April 6, 1917, and November 11, 1918. Except for the one year which must have been in the Officers' Reserve Corps, there will also be credited service as a federally recognized officer of the National Guard since November 11, 1918. No service of any kind prior to April 6, 1917, is to be credited, nor is any but active service between April 6, 1918, and November 11, 1918, to be credited.

In determining fitness for promotion the boards will examine into the following in such order as it desires:

(*a*) Physical fitness.
(*b*) Moral character.
(*c*) General fitness.
(*d*) Professional fitness.

Regardless of physical or other disqualifications, the examination of each officer will be completed unless the officer upon being informed of such disqualification requests his examination be discontinued.

The basic subjects required for all officers being examined for promotion are the same as those subjects examined in for appointment; that is, administration, customs of the service, courtesy and military discipline; military hygiene; practical efficiency. In addition, officers of the veterinary section will be examined in recent progress in veterinary medicine and surgery, hygiene—animal, meat and dairy.

Had there been such an established military policy and organization when the United States entered the World War, mobilization in 1917 would have proceeded as a decentralized process and not as a great centralizing process upsetting the economic life of the Nation. Organized and officered divisions would have passed to war strength under a decentralized system, each in its proper area. It would not have been necessary to spend millions for great concentrated training camps or to overburden the railroads with unclassified personnel and material in order to organize and train and equip and provide officers all at the same time. The young men of each community when called to war would have found organizations near their homes prepared to receive and clothe and train them. Officers of all grades, both regular and reserve, would have passed without confusion to predetermined places. It would not have been

necessary to pour the man power of the Nation into great central hoppers for organization and classification, because organization, classification and assignment would have been automatically indicated by the obvious requirements of the peace-time territorial organization. There would have been little of the confusion and malfunctioning that comes from putting square pegs in round holes, because each officer, whether of the Regular Army or the Reserve Corps, would have taken up duties for which he had specifically been preparing. It would have been unnecessary, upon mobilization, to establish extraordinary means of liaison between the Army and the business world, because contact between the Army and all of the people would have been an obvious fact throughout all of the long interval of peace.

Such a national organization must have saved months in time and millions in money with a minimum strain upon the economic and industrial life of the Nation.

It is the object of our new military law to establish such an organization. It proposes to localize and perpetuate the principal military units that fought in the World War. It offers an opportunity for the veterans of the war to join these units on a voluntary basis and to participate in the training of their ultimate replacement. It provides for organized contact between the professional officers of the Regular Army and the reserve officers of the National Guard and the Organized Reserves. It provides for permanent peace-time organization of our system of national defense. These are the great simple objects of the law. The many detailed provisions that apparently obscure it are simply necessary means of welding our pre-existing military institutions into the permanent structure of the Army of the United States.

In appointment, as in other matters pertaining to reserve officers, a policy of decentralization is observed, only sufficient centralized control being retained as is essential to the maintenance of a reasonable degree of uniformity throughout the entire Officers' Reserve Corps. In all cases in which appointment may be made based upon an examination of records only, examinations are conducted in Washington, where the records are filed. In all cases requiring a personal examination the conducting of such examination is delegated to department and corps area commanders. To provide uniform standards throughout

the service, the general scope of examinations is prescribed by the War Department. To accommodate to varying conditions, examining boards are authorized to grant such exemptions as, in their judgment, may be desirable to determine details of examination and to make additional investigations, if necessary. With this authority of the boards is coupled a responsibility that they recommend for appointment only those persons who may reasonably be expected to make efficient officers in an emergency. Failure to maintain a proper standard will give rise to a just cause of complaint from reserve officers who expect and who are entitled to the preservation of such a standard, and will indicate a failure to appreciate the outstanding lessons of the World War as to the demand for competent officers and the undesirability of elimination during an emergency.

It is contemplated that, so far as practicable, any future mobilization will be largely one of organizations and not of individuals. The reserve officers who have, in time of peace, obligated themselves to service, and who have received training and instruction, will be called to active duty, either with the organization to which they have been assigned, or for the special duty to which they have been assigned in time of peace. It is not contemplated that persons who have failed to join the Officers' Reserve Corps and to receive instruction in time of peace will be appointed in an emergency until such time as it becomes apparent that the existing reserve of officers is inadequate. Those persons who are appointed and serve in time of peace are thus assured priority for service as officers in war over those who decline or fail to secure appointments in time of peace.

As the National Defense Act establishes for the first time a definite peace-time military policy, so also is it the first time that the veterinary service has been recognized as a necessary adjunct to the Army and included in Tables of Army Organization. The present military policy of the United States depends upon the organization and training of the National Guard and Organized Reserves to complete the Army of the United States for defense in time of an emergency. The veterinary service has been given its proper place in both these organizations, and in order that the profession may be organized and trained and coordinated with the other branches of the service it is essential that we take every means possible of developing the veterinary service of the Organized Reserves.

The Act of 1920 places the burden of the national defense upon the civil population for any emergency other than those of minor importance which the Regular Army will be sufficient to handle. In this way the organization of the veterinary service is placed in the hands of the civilian profession to a great extent, and we are trying to get the men who served in the Veterinary Corps, National Army, during the World War to enter the Veterinary Officers' Reserve Corps in order that they may be able to assist in directing the policies and development of the organization. As the regulations provide for the appointment of veterinarians in civil life who did not serve during the World War, representative men of the profession are desired for appointment in grades commensurate with their professional standing.

The veterinary profession has its opportunity now to develop equally with the other professions in the Army of the United States, and it is only by the civilian members coming into the Organized Reserves that they can shape the destiny of the profession. It can be done only from inside the ranks of the profession and not from the outside, as we of the regular service have learned too frequently during our struggle for recognition in the Army.

It hardly seems possible that those who saw the results of the utter lack of organization of the veterinary profession for military service in 1917 would not recognize the inclusion of the veterinary service in the scheme for the establishment and training of the Organized Reserves and the National Guard as an opportunity to place the profession in the Army of the United States on an equal plane with other professions.

During the World War the largest number of veterinary officers on duty was 2,234 on November 30, 1918. Of this number 1,781 were in the Veterinary Reserbe Corps, 1,596 commissioned from civilian life, and 185 from the enlisted force.

The Veterinary Corps of the Regular Army must be reduced to 126 officers by January 1, 1923, and 6 more officers than were provided by the Act of 1916. Today there are less than 500 officers in the Veterinary Section of the Organized Reserves, and under these conditions the pitiably small regular corps would be as helpless in the face of an emergency as it was in 1917.

What are you going to do about it? Do you consider it essential that the veterinary profession be not found wanting in the furtherance of plans for the defense of our country? The

way to avoid such a calamity is to get into the Organized Reserves. We want 3,000 officers in the Veterinary Reserve Corps.

It is a simple matter for any veterinarian to make known his wishes as to joining the Reserve. The United States is divided into nine military departments known as corps areas. Applications for commissions and requests for information should be addressed to the Commanding General of the corps area in which the applicant resides, for the reason that matters are handled by these officers. The following list shows the territory embraced in each corps area and the address of the Commanding General:

Corps Area	*States*	*Address Commanding General, Corps Area at*
1st	Maine New Hampshire Vermont Massachusetts Connecticut Rhode Island	Headquarters, Army Base, Boston 9, Massachusetts
2d	New York New Jersey Delaware	Headquarters, Governors Island, New York
3d	Pennsylvania Maryland Virginia District of Columbia	Headquarters, Standard Oil Building, Baltimore, Maryland
4th	North Carolina South Carolina Georgia Florida Alabama Tennessee Mississippi Louisiana	Headquarters, Fort McPherson, Georgia
5th	Ohio West Virginia Indiana Kentucky	Headquarters, Fort Benjamin Harrison, Indiana
6th	Illinois Michigan Wisconsin	Headquarters, 1819 West Pershing Road, Chicago, Illinois
7th	Missouri Kansas Arkansas Iowa Nebraska Minnesota North Dakota South Dakota	Headquarters, Army Building, Omaha, Nebraka
8th	Texas Oklahoma Colorado New Mexico Arizona	Headquarters, Fort Sam Houston, San Antonio, Texas

Corps Area	*States*	*Address Commanding General, Corps Area at*
9th	Washington Oregon Idaho Montana Wyoming Utah Nevada California	Headquarters, Presidio of San Francisco, California.

In the compilation of this paper extensive extracts have been made from Special Regulations Nos. 43, 44, 46 and 48 and Bulletin 19, 1921, which are War Department publications, and from a paper entitled "The Army of the United States," by Colonel M. B. Stewart, published in the *U. S. Infantry Journal* for April, 1922.

DID NOAH DO IT?

It was a hot day on the border. The regiment had been ordered to move, and for more than an hour a soldier had tried to get his mule into a box car. The chaplain came along and began to laugh at the soldier's discomfiture. The poor soldier turned as he wiped his perspiring brow and said: "Chaplain, how did Noah ever get two of these things into the ark?"—*Everybody's Magazine.*

As a war memorial the Royal (Dick) Veterinary College of Edinburgh has installed a library and a tablet bearing the names of fourteen graduates and students who died in the war.

Give me morning and a horse and I have all wealth; I sport with the earth. I leap upon the mountains. The cold clouds of mortality roll back before the immortal horseman. Swing into the saddle and take the old trail, for it leads away from weakness and despair.—*Stanton Davis Kirkham.*

General Pershing said recently at a dinner of the Horse Association of America: "There will never be anything that can take the place of the horse and the army mule in warfare. If we had had more horses in the World War we might have done better than we did. I believe the horse is coming back into his own."—*New England Farms.*

PRESENT PROBLEMS OF OUR ANIMAL INDUSTRY[1]

By J. R. MOHLER

Chief, Bureau of Animal Industry, Washington, D. C.

THE domestic-animal population of the United States on January 1 of this year numbered approximately 183 millions, or one and two-thirds times our human population. The value of livestock has been estimated at about 5 billion dollars. At the time of the last census the value of livestock more than equaled the combined value of all the cotton goods, flour and other gristmill products produced in the United States, or twice the value of the combined output of our foundries and machine shops.

In the development of this great industry we have had to contend against storms, drought, barriers against our export trade, and incomplete knowledge concerning the cause of diseases and of the principles of breeding, feeding, sanitation, and the care of animals. But of all impediments to the development of the industry, disease has been the greatest. Hog cholera, tuberculosis, contagious abortion, glanders, rabies, anthrax, blackleg, Texas fever and pleuropneumonia existed in this country for many years before the Bureau of Animal Industry was established in 1884. From the day it came into existence the Bureau has been striving diligently to protect and develop our livestock industry; and as a result of our cooperative efforts, the National Government, State governments, the veterinary profession and livestock owners can review with pride and satisfaction the history of the continuous growth of the industry and the subjugation of its deadly enemies.

LOSSES FROM DISEASE EXCEED 200 MILLIONS ANNUALLY

Although marked progress has been made in reducing losses from animal diseases, they continue to be much greater than they should, considering the advancement veterinary science has made and the numerous effective weapons that have been developed for offense and defense against animal maladies. It is estimated that the losses from diseases, parasitic troubles, accidents and neglect amount to considerably more than 200 millions of dol-

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

lars annually. Most of the losses could be prevented if the knowledge we have acquired of disease, sanitation and the care of animals were properly and diligently applied. Naturally in warfare against disease, problems arise which must be solved, policies must be established and plans of procedure formulated to prevent loss of effort, to avert misunderstandings and to achieve success without unnecessary delay and expense.

OUR EXPORT TRADE

Our livestock and meat industry was confronted with a great problem when, in the period 1879-1881, our pork was excluded from foreign markets because of trichina infestation, and in 1879 the English government issued an order refusing to admit our export cattle into the interior of Great Britain and requiring their slaughter within a limited time on the docks where they were landed, because of the existence of contagious pleuropneumonia in the United States.

In 1891 the Bureau inaugurated a system of microscopic inspection of pork for trichinæ, and in 1892 the eradication of contagious pleuropneumonia was completed. As a result a profitable export trade was reclaimed and developed. However, the order requiring the slaughter of our cattle on the English docks has never been revoked; it applies alike to cattle from the United States and Canada, and it is admitted in English quarters that it is intended more as a commercial expedient than a hygienic necessity.

PROTECTION FROM FOREIGN DISEASE

A problem with which we are confronted continuously is the protection of our livestock industry against invasions of foreign plagues, such as contagious pleuropneumonia, rinderpest, surra, Malta fever and foot-and-mouth disease. This problem has been met by the enforcement of quarantine regulations which, though not hampering seriously the development of our livestock industry, has proved so effective that no destructive foreign plague has as yet passed the barriers of our quarantine stations. Never in our history have we been so completely surrounded by foot-and-mouth disease as we have been since the close of the World War. While Great Britain has been spending millions of dollars in efforts to suppress the most extensive outbreak in that country in the present generation, and its ravages have been

reported from most European, Asiatic and South American countries, the United States has thus far escaped a recent invasion of this dreaded disease.

An important problem that confronts us now is preparation to combat an outbreak should one occur. Ever since the eradication of our last outbreak of 1914 the Bureau has been urging the States to appropriate funds and to organize their veterinary forces so as to be able to cooperate promptly in the work if another occasion should suddenly arise.

DOURINE

The spread of dourine among horses on the ranches of North Dakota, South Dakota, Montana, Wyoming, New Mexico and Arizona became a menace to our horse industry. Attempts to control this disease through inspection and quarantine proved impractical and inffectual, especially under ranch conditions. The problem was met in 1912 by adopting and perfecting the complement-fixation test for detecting the disease in its incipiency. Definite progress has been made in eradicating dourine ever since this new method of discovering affected animals was developed. From 1913 to 1921, inclusive, approximately 300,000 horses were tested, of which 910 affected animals were condemned and slaughtered. While the disease yet exists to a limited extent in South Dakota and on the Indian reservations of Arizona, its complete elimination under present methods is assured within a few years. Only those who are familiar with the nature of this disease can appreciate what its eradication means to our horse industry.

HOG CHOLERA

Hog cholera has been allowed to exist in the United States for 89 years. From 30 to 60 million dollars' worth of swine annually die from this disease. The problem of preventing these enormous losses was partially solved when in 1905 a serum was developed by the Bureau of Animal Industry which makes it possible to immunize swine against hog cholera. Permanent immunization involves the use of a virus which is dangerous when not properly produced and applied. It is evident that we shall never succeed in completely eradicating hog cholera through the use of the immunization treatment alone. The problem that now confronts us is to devise a systematic use of serum and virus, to-

gether with an intelligent application of the knowledge we have acquired concerning this disease, the rigid enforcement of quarantine regulations and the practice of better farm sanitation. At present the National Government and the States are concentrating their efforts on the eradication of other destructive diseases, especially tuberculosis, and the tick which causes Texas fever, but the time will come when our swine producers will demand the energetic action of National and State livestock sanitary authorities and the appropriation of funds by both agencies to help them eradicate hog cholera.

TEXAS FEVER

The extermination of the Texas-fever tick will continue to be an important problem until the last tick is destroyed. Cooperative tick-eradication work was commenced in 1906. Up to the present 72 per cent of the 729,852 square miles originally quarantined have been freed from ticks and released from quarantine with an expenditure of National, State and county funds which together equals less than one-half the cost of building and equipping a modern battleship. We have yet to free 206,014 square miles of tick-infested territory, or an area approximating the combined areas of the States of Ohio, Pennsylvania, New York, Maine, Massachusetts, Vermont, Connecticut, Maryland and Delaware.

Naturally there is a tendency for some cattle owners to manifest less interest in tick eradication as soon as their farms or ranches are included in territory released from quarantine, and there are others who do not welcome the eradication of ticks because they have been profiting financially through the existence of the pest. But, generally, livestock producers, State legislatures and State regulatory authorities are to be commended for the zeal they have shown in this great work. The eradication of the Texas-fever tick is a national problem, and in the interests of our national livestock industry it must be carried to completion as rapidly and economically as possible. Our greatest problem in this work is to stimulate and hasten efforts to get the last tick.

BOVINE INFECTIOUS ABORTION

Some breeders and veterinarians rank bovine infectious abortion as the most destructive and troublesome disease of cattle, and

it would be difficult to prove that it does not merit this unenviable distinction. The losses it causes, though they can not be definitely estimated, are enormous, and threaten to increase unless vigorous efforts are made to check its further spread.

In addition to actual abortions and the birth of weak calves, the disease must further be charged with being a common cause of serious morbid conditions of the reproductive organs and functions, which greatly reduce the breeding efficiency and general productivity of the affected animals, so much so that it is questionable which is of greater importance, the primary evil or its sequels.

The essential causative agent, the Bang abortion bacillus, has long been known, but many of the factors upon which the control of infectious abortion must ultimately depend remained obscure until quite recently. Among these factors are the frequent, long-continued persistence of the abortion bacillus in the udders of apparently healthy, infected cows, its frequent presence in the uteri of such cows during seemingly normal gestation, and its dissemination from the uteri of such cows with the by-products of seemingly normal parturitions.

These factors are responsible for the insidious spread of the disease, and it is therefore gratifying to know that available abortion tests promise to be as serviceable for the detection of carriers and disseminators of abortion bacilli as the tuberculin test is for the detection of occult cases of tuberculosis.

It may be said for the benefit of those who hope to obtain relief from the abortion evil through the use of specific biological products that vaccination has not yet passed beyond the experimental stage and that the results obtained with these treatments must be carefully studied before any definite conclusions are drawn.

The investigations of the Bureau of Animal Industry, which must be credited with a fairly large share of our increased knowledge on the problems of infectious abortion, will be continued with the determination to conquer this destructive plague of breeding animals.

TUBERCULOSIS

A problem that is receiving unusual attention at present is the eradication of tuberculosis from our bovine population. The

presence of this disease in our herds was too lightly treated for many years by those concerned, and, in consequence, it increased to a point where its eradication is now a great economic as well as a national health problem.

The tuberculosis-eradication campaign in which we are now engaged is not an enterprise of the National Government or any individual or State. Cooperation is the foundation upon which the accredited-herd plan was inaugurated. This plan was unanimously adopted by the United States Live Stock Sanitary Association and by representatives of the purebred cattle breeders' associations in December, 1917. The progress made thus far is very largely the result of the coperative plans formed in the beginning. While the progress made is very gratifying, we must not allow success to dazzle our vision of future contingencies nor to make us lose sight of the methods by which this vital work has proceeded so satisfactorily thus far.

Up to the present there have been few serious obstacles encountered, and enthusiasm in the campaign has been increasing steadily. The demand for the work is greater than the funds and facilities provided for carrying it on, and there has been very little of the opposition that energetic disease-control measures so often encounter. We have had excellent support from the press and have been helped by an enlightened, sympathetic public sentiment, because those who are interested in our livestock industry have come to realize the necessity of eradicating tuberculosis while it is yet possible to do so. Under such encouraging conditions I can conceive of nothing except the lack of sufficient funds that will retard it, and the useful facts we are acquiring through experience will be helpful in facilitating the work.

A few years ago the eradication of bovine tuberculosis seemed an impossible undertaking. Then we relied only on physical examination and the subcutaneous test for detecting the disease, but experience has shown that in the use of combination tests we now have methods that are much more rapid and at the same time more reliable. The intradermic and ophthalmic tests were known chiefly by name ten years ago and now they are being used on a wide scale. They have given great impetus to the elimination of tuberculosis and have made possible the area work which is becoming so popular.

There are instances where macroscopic lesions are not revealed in reactors on postmortem examination as conducted at our packing houses where these animals are slaughtered. While this tends to create doubt in the minds of some as to the efficiency of tuberculin as a diagnostic agent, it should be remembered that an animal which reacts to the tuberculin test in the incipient stages of the disease may not be sufficiently advanced to reveal lesions at postmortem which are visible to the naked eye. The tuberculin test has a scientifically sound basis, and those who are so inclined should hesitate to condemn it because visible lesions are not always revealed in reactors by the postmortem examination at the packing house.

Careful Study of Herd Is Important

No doubt some errors have been made in administering tuberculin to animals when conditions were present which interfered with or obscured the reaction of tuberculin. Such cases have been comparatively infrequent, and, with a view to reducing the proportion of non-lesion reactors and yet have no tuberculous animals in herds, efforts are being made to make the test more perfect by giving more careful attention to the study of the history of the herd and the physical conditions of all animals about to be tested.

Although a non-lesion reactor may be found more or less frequently, tuberculin is the best agent we have at present for detecting the disease in live animals, and that it is proving generally satisfactory is evident from the great demand for the test.

Private Practitioners and Official Testings

In the original plan of eradication adopted by the United States Live Stock Sanitary Association and representatives of breeders' associations, and approved by the Bureau, it was specified that the test should be administered only by regularly employed State, county and Federal veterinarians. It soon became apparent, however, that these regularly employed forces would be unable to meet the demands for advance work and conduct the retests to keep herds on the accredited list. In meeting this problem it was suggested that after herds become accredited they be turned over to private practitioners who shall be permitted to conduct the yearly retests at the owners' expense. The

recommendation was accepted, and in order to protect the interests of livestock owners against incompetent veterinarians it was arranged to accredit for this important work only veterinary practitioners who are able to show their competency through passing an examination.

At present accredited veterinary practitioners participate in the tuberculosis-eradication campaign to the extent that they are permitted to conduct the yearly retests of accredited herds; their initial tests of herds in which they find no reactors are accepted as the first test for accreditation, and they, as well as other approved veterinarians, are permitted under Regulation 7 to test animals for interstate shipment. Likewise the Canadian Government accepts the services of these accredited veterinarians for mallein testing horses and tuberculin testing cattle destined for export to Canada. As a sidelight on the relation of both the Canadian and this Government to the practitioner, attention is called to the fact that on July 1, 1922, we ceased the manufacture and promiscuous distribution of blackleg vaccine to stock owners, while Canada followed this same course on August 1, 1922. This means that more practitioners will be engaged to vaccinate cattle against blackleg in future than have been employed in the past.

Some have expressed dissatisfaction because the practitioner is not employed in tuberculosis work on the same basis as the regularly employed State, county and Federal veterinarians, and have insisted that in advance work owners should be paid indemnity for reacting cattle tuberculin tested by private practitioners. In reply to a recent inquiry received from a veterinary practitioner, the statement was made that the Bureau would be perfectly willing to approve a plan to pay indemnity for tuberculous cattle that react to tests applied by other than regularly employed State, county and Federal veterinarians provided the funds appropriated for tuberculosis eradication were sufficient to carry out such a plan.

At the time Congress made the first appropriation for cooperative tuberculosis-eradication work in 1917 there was no provision made for paying indemnity. However, when hearings were held the following year on the agricultural bill, a demand was made by cattle breeders that funds be appropriated for the payment of indemnity. The amount appropriated for indemnity

that year was included with the fund for operating expenses. This fund was not sufficient to carry on the work and pay for the number of reactors found by the comparatively few State and Bureau inspectors regularly employed. The following year the indemnity appropriation was increased, and each year since there has been an increase. Nevertheless the indemnity has always been exhausted months before the end of the year. At the present time 417 regularly employed county, State and Bureau veterinarians are engaged in tuberculosis-eradication activities. The number of reactors that will be found by this small force will more than consume this year's indemnity appropriation within eight months.

The eradication of tuberculosis is a national matter, and any policy adopted in connection with it must be national in character and scope, regardless of any benefits to be derived by any person or class of persons. It can not be confined to any one breed of cattle, and it can not be limited to one State to the exclusion of others when they request it. A review of the history of tuberculosis in this country and the manner in which it has been handled in the past shows that it is absolutely necessary that official forces, State and Federal, be maintained for the purpose of leading and directing if any progress is to be made in the suppression of the disease.

The Bureau is fully in sympathy with any policy that would bring into the work the valuable services of the private practitioners throughout the country, and if there were funds available today the Bureau would heartily recommend that indemnity be paid for tests applied by all accredited veterinary practitioners.

Indemnity Fund a Limiting Factor

For the fiscal year beginning July 1, 1922, there is available $1,727,600 of Federal money for the payment of indemnities. This appropriation must be divided among all the 48 States in which indemnity is paid, and, also, allotments made for Alaska and Hawaii. You will appreciate the fact that if indemnity is to be paid on tests conducted by any private veterinarians it would be entirely unjust if they were not all placed upon the same status. At the present time 4,338 accredited veterinarians are on the list. You will also agree that one veterinary practitioner

should not be permitted to incur indemnities in excess of the pro rata for all those approved. Such a division of the available funds would allow, for each private practitioner, an average of $398.25 to cover a period of 12 months, which calculation does not include the 417 official veterinarians now representing the counties, States and Federal Government. This means that many practitioners would test only one herd a year, and some of them would create a deficit even then, through finding more reactors in that one herd than their small allotment would pay for.

It has been suggested that the Bureau and State forces be disbanded and that all of the testing be turned over to private practitioners, a plan which could not under any circumstances be contemplated under present law. In many instances farmers have shown a disinclination to turn their accredited herds over to practitioners, and, further, the livestock owners of the United States insist that each State maintain an organization for the purpose of controlling and eradicating infectious diseases of livestock, and Congress has explicitly signified the same attitude. This work must proceed, and there seems to be no other way so satisfactory to all concerned in keeping up the enthusiasm of the stock owner as the method of procedure now employed. If the livestock owners would be willing to carry on the campaign without compensation for tuberculous animals, there would be no obstacle in the way of approving every qualified veterinarian in the United States to make tuberculin tests. But without the indemnity feature the interest of the majority of farmers would surely wane and the pendulum would swing from increased testing to little or no testing unless compulsory measures were followed.

The Bureau has, on every occasion when it has been possible to do so, recommended the utilization of private veterinarians in animal-disease-control work, and their services have been eminently satisfactory. They would be satisfactory in tuberculosis work if there were any means by which they could all be employed on the same basis as the State and Federal veterinarians. The fact that private practitioners can not obtain indemnity for their clients when making private tests does not seem to have reduced their tuberculosis practice. The reports received by the Bureau indicate that they are testing many more cattle than prior to the inauguration of the cooperative campaign. From

many sections of the country veterinarians have reported that their tuberculosis work has increased very materially by reason of the campaign, and commercial laboratories report far greater demands of practitioners for tuberculin than ever before. Another indication that the practitioners are doing more testing than ever before is the report of the United States Bureau of Standards, which shows a great increase in the demand of veterinarians for standardized thermometers for tuberculin work.

Accredited Herds and State Action

It is optional with the State authorities when accredited herds shall be turned back to the private practitioner. The Bureau urges them to turn such herds over to accredited private practitioners as soon as possible after they are placed on the accredited list. Unfortunately in some of the States the sanitary officials have not availed themselves as they should of this provision of the accredited-herd plan, but it will be necessary for such action to be taken. If owners refuse to have the testing done by accredited veterinarians, it would be better to drop their herds from the list, as it is manifestly unjust to keep on furnishing public service to owners of herds that have been freed of tuberculosis while the owners of infected herds are waiting patiently to have theirs tested.

In the State of Michigan a number of private practitioners have actively engaged in the cooperative work while the campaign was being conducted in their territories. They were employed by the county or the State, and indemnity was paid for the animals they found affected. This arrangement proved satisfactory to all concerned.

In the State of Iowa there are several townships in which the cattle have been tuberculin tested by private practitioners who were paid by the owners and no Federal or State indemnity was asked for the cattle condemned.

Private practitioners are employed to conduct tuberculin tests in numerous instances where towns and municipalities have passed ordinances that require the tuberculin testing of dairy cows furnishing milk to such towns. Of course in such instances there has been a strong sentiment among the livestock owners to eradicate tuberculosis regardless of the payment of indemnities,

and this sentiment is due largely if not solely to the educational and publicity work fostered by this campaign.

The Bureau of Animal Industry operates only in States where the services of its employees are desired. It does not presume to have the right to go into any State to carry on disease-eradication work without the consent and cooperation of the proper State livestock sanitary officials. The respective States possess the authority to control and suppress infectious diseases within their borders, and they have invited the Bureau to send in representatives to assist the livestock owners in the suppression of tuberculosis. The State and National Governments are performing this duty to the best of their abilities, and judging from the requests from all quarters for more cooperation, the results obtained seem satisfactory. On June 1, 1922, there were on the waiting list 34,774 herds to be tested, and if the livestock owners had been encouraged to sign agreements and await tests, there would be many more herds on the waiting list. Would this condition obtain if all indemnity were expended in less than one month, and would the farmer's enthusiasm be maintained through the eleven months of inactivity?

During the early days of this movement some practicing veterinarians were inclined to look upon the cooperative plan with suspicion. However, as the work progressed and as every promise was fulfilled relative to the return of accredited herds, the testing of newly purchased and sale cattle, also the prediction proving true that the work performed by State and Federal forces would stimulate a desire throughout the country for tuberculosis-free herds to such a degree that the local practitioners would be called upon to test far more than ever before, the confidence of the progressive practitioners has been gained. In our area work we find many of the local practitioners are taking an active part in interesting the Boards of Supervisors in the project. They are also active in getting the herd owners signed up. Quite a large number have spent considerable time riding with the inspectors for the purpose of gaining experience in the use of the newer methods of testing. Realizing that the task of keeping our herds free from tuberculosis in the future is to fall upon the practicing veterinarian, it has been our endeavor to gain his support by taking him into our confidence and always standing ready to give him assistance so far as possible.

CHANGES OCCURRING IN DAIRY PRODUCTION

In connection with the study of animal diseases it is important to consider the general trend of livestock development. In the case of dairy cattle it is interesting to know that the number of dairy cows for every thousand persons in the country has decreased materially in the last 50 years. During the same period, however, the production of milk per animal has more than doubled, a rather surprising occurrence in so short a time. However, the average milk production of dairy cows is still less than 4,000 pounds a year, which is scarcely half the product of a first-class dairy cow and much below the average of many large herds. Such information is of interest to livestock officials and veterinarians. The improvement in production of cattle is evidence that they are being bred and fed more skilfully; and in most cases highly productive cattle are more valuable than stock of common quality. It is natural for any livestock owner to take better care of animals that have superior earning capacity and value.

In view of the increasing skill and knowledge of livestock owners, it is highly important that veterinary practitioners and others who meet farmers in a professional way inform themselves regarding modern practices of management. While every veterinarian can not be expected to be an expert animal husbandman in all branches of livestock work, a person can scarcely hope to win and retain the confidence of a farmer unless he is able to discuss with him intelligently the essentials of livestock management, breeding and sanitation.

These thoughts are presented informally with the suggestion that the current trend of livestock raising receive careful study even though it may seem remote from one's specialized work.

THE HORSE SITUATION

As another illustration of changes in the livestock industry we have the situation surrounding the production and use of horses.

The advent of the automobile and the farm tractor seemed for a time to threaten the destruction of our horse-raising industry, but the results have not been as serious as anticipated by many. According to the 1920 census, which is the latest published, our horse and mule population for that year numbered 27,283,413. From 17 to 19 million collar-broken draft animals are needed to

handle the work of crop production, and from 2 to 3 million more are needed for nonagricultural work. The number of deaths in 1920 exceeded the number of three-year-old colts produced to fill the vacancies by 482,963. The 1920 figures also show that the birth rate of horses and mules is not keeping pace with the death rate. A 25 per cent increase in breeding is required to maintain our present horse and mule population, and according to recent information of the Bureau of Agricultural Economics there has been a decrease since January 1, 1920, in the number of horses on farms, and only a small increase in the number of mules.

The shortage of draft animals is stimulating increased breeding, but at present it is retarded by the scarcity of good breeding stock, especially males, so that under favorable conditions it will require at least two years and perhaps more to bring the birth rate up to the death rate. Fourteen States from which comparable reports were available for the period from 1915 to 1921 showed a decrease of 60.8 per cent in the total number of serviceable stallions and 4.3 per cent in the number of jacks.

The indications are that we may look for gradually increasing prices of horses and mules for the next five years. But in considering the need for increase in horse production it should be remembered that only good horses are profitable. The market demands a "horse for a job." There is no great demand for the poorer grades. Selection of the right kind of breeding stock, plenty of good feed and proper training and management of young horses are essential factors to profitable production at this time.

DEVELOPMENTS IN SWINE INDUSTRY

The swine industry presents numerous problems in addition to the control of hog cholera, already mentioned. For instance, there has lately been an unusual interest in the production of bacon hogs for export to Europe, in the effect of peanut feeding on the quality of pork, and in other matters affecting the demand for pork and its products. Most of these problems are discussed in a commendable manner in the agricultural press, consular reports, and at livestock meetings. Persons engaged in the swine industry or whose work is related to the production of hogs may wisely study the development of progress in the several lines referred to.

You will see from these remarks that the problems of our animal industry are constantly changing, but fortunately the intelligence which veterinarians and livestock owners have shown in handling the various situations gives promise that no problem need be considered too difficult to solve.

Disease control in general is well in hand, and with the current attention, both by organizations and individuals, to breeding, feeding, and economic questions of production and consumption the outlook is encouraging. For many years the livestock industry of the United States has been greater and more diversified than that of any other country, and I see many indications that our position in these respects will not only continue but will even improve.

FLORIDA RANCH DEMONSTRATES VALUE OF SUPERIOR SIRES

By the use of selected bulls of superior quality, an extensive beef-cattle ranch in central Florida has increased the weight of its calves by from 30 to 50 per cent over that of native calves of the same age. Starting five years ago, according to W. F. Ward, a former employee of the United States Department of Agriculture and now associated with the ranch, the owners have improved both type and quality. The breeding operations involve the use of more than 100 purebred bulls and a total of about 30,000 head of stock. In the absence of a sufficient number of purebred bulls, carefully selected crossbred and high grades are likewise used temporarily.

The ranch raises approximately 90 per cent of the bulls needed and the quality is improving from year to year. The breeds of cattle raised include Aberdeen-Angus, Shorthorn, Hereford and Brahman. A small herd of purebred cows was recently acquired chiefly to raise purebred bulls, but the main operations consist in grading up the native stock by the use of superior sires and selling the product for beef.

Officials of the ranch in charge of breeding operations have reported their experiences as a contribution to the "Better Sires —Better Stock" movement. The quality of the calf crop this year is reported as noticeably better than for any year in the past.

PRACTICAL ASPECTS OF BLACKLEG IMMUNIZATION

By William N. Berg, *Brooklyn, N. Y.*[1]

1. Blackleg Filtrate Versus Blackleg Aggressin

ALTHOUGH numerous products have been used to immunize cattle and sheep in the United States, but two have found widespread use. These are known as "blackleg filtrate" and "blackleg aggressin." The blackleg filtrates first produced were of high potency and were favorably received. Lately, filtrates having low potency, and in some cases filtrates having no demonstrable potency whatever, have been placed on the market. A decline in the use of filtrate resulted, and blackleg aggressin has largely replaced it.

A careful search of the literature has revealed no experimental data which substantiate the claim so often made or implied, that aggressin protects cattle and sheep any better than filtrate. On the contrary, the available comparative data indicate that blackleg filtrates can be prepared and have been prepared with a potency higher than that of any aggressin.

2. How Choose a Blackleg Immunizer?

It is obviously desirable to ascertain which products confer the highest degree of immunity for the longest time. The veterinarian instinctively turns to Federal and State government reports for comparative tests, and finds but one official report, *i. e.*, that of the Director of the Kansas Agricultural Experiment Station. This report for 1917-1918 briefly states the relative merits of blackleg filtrate and blackleg aggressin as follows (p. 50): "Preliminary experiments show that this filtrate is fully as efficient in immunizing cattle against blackleg as the germ free-vaccine." In the next report, for 1918-1919 (p. 69), it is stated: "That this laboratory product, the blackleg filtrate, is as efficient as the natural product—the aggressin—has been indicated by this year's investigations."

3. Definitions

Blackleg is an acute, but not contagious, epizootic disease of cattle, swine, and exceptionally of other ruminants, in the course

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of which localized crepitant swellings develop in the musculature, accompanied by febrile symptoms. It is caused by an anaerobe, the *Bacillus gangrænæ emphysematosæ*. (Hutyra and Marek, p. 43, vol. 1.) Although other anaerobes have been found in blackleg material, they are of incidental importance or the cause of mixed infections. The cause of "spontaneous" blackleg in cattle is the typical blackleg bacillus and none other. (Uchimura, p. 316.) Bail was among the early investigators who used the team "aggressin," as follows: "In the tissue fluids of animals fatally infected with a variety of organisms, excepting the diphtheria, aggressins were formed by all the organisms investigated. It was but natural to look for aggressin formation in materials prepared outside the animal body. Soon the existence of typhoid aggressin was found in young bouillon cultures. The aggressin is one of the products secreted by a bacillus." (Bail, p. 745, 748.)

The term "aggressin" as first used designated a substance or substances secreted by a variety of organisms in any suitable culture medium. The term "blackleg aggressin" is now applied to the sterile filtrate obtained exclusively from affected animal tissues. This is somewhat confusing, but this use of the term has probably come to stay. The blackleg bacillus, like many other microorganisms, secretes an aggressin in any suitable medium, whether that medium be in a flask or in the tissues of a susceptible animal.

When the blackleg aggressin elaboration inside or outside the animal body was noted, it was desired to distinguish between the two types of products. For a time the product obtained from affected tissues was called "natural aggressin," while the product obtained from culture filtrates was called "artificial aggressin." These definitions were apparently inadequate. Both products contain the same immunizing principle, *i. e.*, an aggressin elaborated by the blackleg bacillus, and are so regarded by the Bureau of Animal Industry (p. 9, 21). The recent literature distinguishes between the two products as follows: "Blackleg aggressin" is the filtrate obtained from affected muscle tissues. "Blackleg filtrate" is the filtrate obtained from laboratory cultures. These designations have apparently supplanted all previous ones. They are used by the

Bureau of Animal Industry in the above sense, and in the present paper the terms aggressin and filtrate have the above meaning.

ETIOLOGY

An exact definition of the blackleg bacillus is necessary in the selection of strains to be used in the preparation of biological products with which susceptible animals shall be immunized. The following brief description of the blackleg bacillus is taken from recent investigations by Haslam and Lumb (p. 363) and Uchimura (p. 299). A large spore-forming anaerobe, Gram positive, rods occurring singly or in pairs, never in long chains or threads, not a protein putrefier. It ferments dextrose vigorously, forming mainly carbon dioxid and butyric acid. Culture filtrates are nontoxic. A culture filtrate from one blackleg strain immunizes against other strains of blackleg organisms, but not against other anaerobes. (Uchimura, p. 315.)

5. TREATMENT

The treatment of affected cattle is generally unsatisfactory. Favorable results are sometimes obtained by the early injection of 200-300 c.c. of blackleg serum, although normal horse serum is almost as good. (Uchimura, p. 308.) High potency sera have not generally been obtained against any of the organisms of the gas gangrene group. (Kolle, Sachs and Georgi, p. 258.)

Prevention of blackleg by protective immunization is the natural outcome of the impracticability of therapeutic treatment.

6. PREVIOUS BLACKLEG FILTRATES

Preparation.—Blackleg filtrates have generally been prepared as follows: Media of various types were prepared, often containing pieces of meat, as in the meat piece broth of Nitta. After sterilization by heat, the media were inoculated with pure seed cultures of the blackleg bacillus. After a suitable growth period, usually from 24 to 72 hours, the cultures were freed from bacilli by filtration. The filtrates were tested for toxicity and sterility before release for immunization purposes.

Limitations.—Sterilization is the first difficulty, especially with meat piece media. Because of the high bacterial content of ordinary market meat, and the great resistance of their spores to heat, a very long heat sterilization of 100° C. is required be-

fore it is certain that all organisms and spores have been destroyed. By the time all microorganisms and spores were killed the media had been heated enough to impair their value as sources of nutriment for the blackleg bacilli. It is well known that foods heated for long periods such as 1 to 3 hours at the boiling point, 100° C., or sometimes at higher temperatures in the autoclave, lose part of their nutritive value because vitamins and perhaps other necessary nutritive substances are destroyed, wholly or in part, by the high heat. Many failures to grow the blackleg bacillus in pure culture in such superheated media undoubtedly were caused by lack of vitamins or similar substances. Workers who attempted to correct this defect by fractional sterilization at 60° C. on three successive days obtained nothing for their efforts but an impure culture due to spores that survived the sterilization.

A second difficulty was the proper adjustment of the reaction or pH of the media. The adjustment of the reaction of a medium to pH 7.6 before sterilization is comparatively simple. This reaction is favorable to start growth of the blackleg bacillus. But when the medium is sterilized by heat, the pH changes as if acid were produced during the heating. The pH frequently shifts to 6.6, which is not suitable for starting growth. Sterilization by heat not alone destroyed nutritive factors in the medium, but also caused indeterminate changes in reaction that could not be calculated in advance and allowed for. Such difficulties may arise in any medium, but they are accentuated by the presence of large quantities of meat. Bengtson (p. 18, 19) describes the difficulties involved in adjusting the pH of medium consisting of 200 grams of veal to 300 c.c. of beef infusion broth as follows: "Different lots of veal vary in regard to acid production and it is difficult to control absolutely the factor of heat so that the desired final reaction may be obtained. * * * It was found that the individual flasks of medium varied to a considerable extent in reaction, usually ranging from pH 7 to 7.5."

Unquestionably, the culture of the blackleg bacillus on a large scale in media sterilized by heat is difficult and the element of luck plays an appreciable part. What probably happens is that vigorous growth takes place only in those flasks in which

the heat has not too greatly denatured the nutrient materials and as a matter of chance the reaction is near pH 7.6.

A third difficulty in preparing blackleg culture filtrates was in keeping the cultures alive long enough. In order to make aggressin, the bacillus requires time as well as a suitable medium. There seem to be no records in the literature of attempts made to adapt the medium to the special needs of the blackleg bacillus so that cultures may be grown for several weeks instead of days. This is entirely practical in the new medium used in preparing thirty-days blackleg filtrate. Most, if not all, of the filtrates hitherto prepared contained only so much aggressin as the bacillus could elaborate in a very few days.

The above mentioned difficulties may explain the fact that certain commercial blackleg filtrates, when tested by the Bureau of Animal Industry, showed no immunizing value whatsoever, while several were poor.

7. BLACKLEG AGGRESSIN

Preparation.—Virulent cultures of blackleg organisms are injected into the fleshy parts of a young calf. The bacilli multiply and produce death of the calf in 36 to 72 hours. The dead muscle tissue near the sites of infection is dark colored and partly disintegrated. This is cut out of the carcass, hashed and pressed to obtain the muscle juice. This juice is then filtered through bacteria-retaining filters to make it safe to inject into other animals. The sterile filtrate is the finished product. When injected into cattle and sheep it immunizes them against the effects of infection with blackleg bacilli, provided the infection be not too severe.

The carefully prepared media required in blackleg filtrate preparation are not needed in preparing aggressin. Here the medium is furnished by the calf's tissue fluids or living muscle juice. The calf may be regarded as a small tank of ready-made medium. This is perhaps the only advantage that aggressin preparation has over blackleg filtrate preparation.

Limitations.—The comparatively short length of time during which the blackleg bacilli can elaborate aggressin while growing in the calf tissues is a limitation to which properly adjusted culture media for blackleg filtrate production are not bound. In a living calf the bacillus may elaborate aggressin

for about 4 days; in the usual culture media, for, at most, 8 days; but in the new medium aggressin production goes on for 30 or more days. The rate at which aggressin is formed is also to be considered. In the living calf the multiplication of the blackleg bacillus and the attendant aggressin formation are opposed by the leucocytes and other natural defences in the animal, which resist the invading organism. It is only after the local defenses have been broken down that the bacillus multiplies and forms aggressin, and shortly after that the animal succumbs. During the short interval there is aggressin formation against more or less resistance. In culture media in flasks there is no animal's defensive resistance to be overcome. Beginning with the time of inoculation with pure seed culture, aggressin formation goes on continuously.

8. Testing Blackleg Products Before Release

Blackleg products must pass three tests before being released. These tests must show that the product is (1) free from poisonous substances, (2) free from pathogenic organisms, and (3) capable of immunizing susceptible animals against large doses of virulent blackleg bacilli.

Toxicity.—Guinea-pigs are suitable animals for this test. A comparatively large dose, about 5 c.c., of the finished product is injected subcutaneously or intramuscularly into one or more guinea-pigs. Survival without symptoms or local lesions indicates that the product contains no poisonous substances.

Sterility.—The object of this test is to make certain that the product contains no blackleg bacilli or spores or any other pathogenic material. As ordinarily carried out, blackleg products are tested for sterility by injecting guinea-pigs intramuscularly with 5 c.c. doses. If this dose contain an appreciable number of blackleg organisms or spores, the guinea-pigs succumb to blackleg. If only few organisms are present, the guinea-pigs may survive, because they are comparatively insusceptible to blackleg. Thus Nitta (p. 473) found that it required as much virus, 0.1 c.c., to kill guinea-pigs as calves. Graub and Zschokke found (p. 60) that it required twice as much virus to kill guinea-pigs as calves and sheep. This insusceptibility led Haslam (*Jour. Immunol.*, p. 541) to the use of brain medium as a more delicate test for the presence of *Bacillus chauveaui.*

Potency.—The object of the potency test is to ascertain whether the product will protect susceptible livestock from the effects of blackleg infection. The veterinarian knows that blackleg immunizing products are not always obtained fresh from the laboratory; they may be over one year old. It is not sufficient, therefore, that a product possess potency when fresh; its potency when a year old is just as important. The veterinarian is interested in knowing how long immunity will last when calves and sheep are injected with products a day old or a year old. Will the product keep? A really comprehensive test for potency, therefore, would involve at least four tests—two tests on fresh products and two on old products, in which the resistance of the experimental animals is tested about 14 days after immunization and about a year later.

Two difficulties are encountered in the potency test as practiced at present. The first is sometimes recognized, while the second is not. The first is the difficulty of determining the minimal lethal dose of any one sample of blackleg virus. The second is the fact that the insusceptibility of the guinea-pig to *B. chauveaui* makes this animal almost unsuitable for potency tests, although it is suitable for the toxicity test and only fairly suitable for the sterility test.

The Animal Injection Test.—In so far as blackleg products are made for immunizing cattle and sheep, their potency must ultimately be demonstrated in cattle and sheep, rather than in guinea-pigs. Official or provisional methods for making the potency test have not yet been published by any of the Government laboratories. Hence a profusion of methods has arisen.

Following is a good example of a potency test (Haslam and Lumb, 1919, p. 365): Fourteen calves were injected subcutaneously with 5 c.c. each of a blackleg filtrate. After two weeks the calves were injected with 10 c.c. each of blackleg virus. The virus was an emulsion of a 24-hour culture, 0.1 c.c. of which usually killed guinea-pigs. These investigators state "that of the fourteen calves treated with filtrate only two were later susceptible to virus. Ten controls receiving virus alone all died of blackleg. It will be noted that the filtrates from four different laboratories possessed marked immunizing properties." The protective value of these filtrates might be stated thus: Five cubic centimeters of filtrate protected calves against 100 minimal

lethal doses of virus for guinea-pigs. And since it takes at least as much virus to kill a guinea-pig as it does to kill a calf, the above filtrates in doses of 5 c.c. protected calves against 100 or more minimal lethal doses of virus. The above results were submitted for publication December 9, 1918, and published in April, 1919. Just one month later (*American Journal of Veterinary Medicine,* May, 1919, p. 258, and *Mulford Veterinary Bulletin,* September, 1919) these investigators published some experimental data to show that blackleg filtrate did not have marked immunizing properties. This time guinea-pigs and not calves were used. The latter tests were made to compare the immunizing values of blackleg filtrate and aggressin and are examples of how a potency test should not be interpreted.

At present there is but one satisfactory method of comparing the immunizing powers of filtrates and aggressins, and that is to inject calves with the products and test their resistance to equal doses of the same virus. Potency tests are easily misleading when guinea-pigs are used. The above investigators claim that blackleg aggressin is, in general, better than blackleg filtrate for protecting calves and sheep is not proved. The writer has prepared blackleg filtrate (thirty-days blackleg filtrate) for immunizing calves and sheep. Small doses of this filtrate generally did not immunize guinea-pigs, but they did immunize calves to large doses of extremely virulent virus.

It is not possible to state why guinea-pigs are unsuited for the potency test; to say that they are "naturally insusceptible" begs the question. The following investigators claim to have immunized guinea-pigs with blackleg filtrates: Nitta (p. 476), Eichhorn (p. 412), Kelser (p. 259), Graub and Zschokke (p. 65) and Uchimura (p. 58), differing, in this respect with the previous investigators. The fact that uniform results have not been obtained with guinea-pigs is good reason for using calves for all critical potency tests.

The above described test with calves involves no difficulties. By this test it is comparatively easy to determine whether a product has some immunizing value or none. The difficulties arise when attempts are made to compare the immunizing properties of two products against large doses of virulent virus, with a view to determining which product confers the greater immediate resistance. Although there is no exact experimental

method for making the comparison, indirect data can sometimes be used (see Tables 1, 2, 3, 4). Guinea-pigs are no more suitable for potency tests on blackleg aggressin than on filtrate. Comparatively large doses of both filtrate and aggressin are required to protect guinea-pigs against very small doses of virus —in fact, the amounts are so large as to indicate plainly the limited usefulness of the guinea-pig. In order to protect guinea-pigs against 0.5 c.c. culture (virus) containing approximately 5 minimal lethal doses of blackleg virus, 10 c.c. of aggressin were required (Haslam and Lumb, p. 258; Haslam, p. 543), a dose which is too large to have practical significance, considering the proportion between the weight of the guinea-pig and the volume of the dose. With usual or more reasonable doses, aggressin protects guinea-pigs no better than filtrate. Thus 4 out of 12 guinea-pigs were protected by 2 c.c. doses of aggressin against 0.1 c.c. (1 minimal lethal dose) of virus (Haslam, p. 543). The writer obtained protection in 5 out of 9 guinea-pigs with the same dose, 2 c.c. of filtrate, against similar doses of virus.

The Aggressin Test.—The Bureau of Animal Industry, realizing the desirability of a laboratory test for potency that would not require calves, has used the aggressin test. The theory of the test is that when a sublethal dose of virus is injected into a guinea-pig along with a dose of the product (filtrate or aggressin) which is claimed to contain aggressin, the presence of the aggressin renders the animal more susceptible and a sublethal dose of virus is fatal, while the control animals receiving only the virus in sublethal doses do not die. The weak point in the test is the difficulty of determining the minimal lethal dose of virus.

The following results were obtained in a series of experiments in which 48 guinea-pigs were injected subcutaneously with 0.1 c.c. to 2.0 c.c. doses of filtrate (thirty days' filtrate). Twenty-two guinea-pigs served as controls, receiving no filtrate. Injection of filtrate was followed by intramuscular injection of what was considered to be 1 minimal lethal dose of dry, powdered muscle virus, at intervals between injections of zero to 2 months. The object was to determine whether filtrate would immunize guinea-pigs. It was soon noticed that the outcome of an experiment was uncertain and might result (1) indeterminately because neither controls nor injected guinea-pigs died.

(2) in showing that the guinea-pigs were sensitized by the filtrate injection, or (3) in showing immunizing action. When looking for immunizing action, the experiment would indicate sensitization, and vice versa, probably because it was so difficult to determine in advance whether a dose of virus would act as a sublethal dose or a minimal lethal dose, or whether the dose injected would kill the filtrate-injected animals as well. Generally, the sensitizing action of the filtrate was apparent up to 2 months after filtrate injection. The guinea-pig may therefore be used in potency tests if sensitization by aggressin, rather than immunization, be looked for.

Complement-fixation Test.—Gochenour has shown that germ-free blackleg filtrates can act as antigens in the complement-fixation test, and consequently the test may be applied to filtrates for the purpose of ascertaining whether the product has immunizing value. This method is very recent, and more time will be required for the development of the very promising results already obtained.

Of the three methods of testing blackleg products for potency, the best is calf injection, second is the aggressin test on guinea-pigs, and last, only because it is so recent, is complement fixation.

9. The Available Comparative Potency Tests

Following is an attempt to compare the immunizing potencies of blackleg filtrate and aggressin. The comparisons are made between the results of those investigators who attempted to ascertain the potencies of their products against carefully weighed amounts of dried blackleg organisms or measured volumes of blackleg culture. Their figures are taken at their face value in all cases and are summarized in Tables 1, 2, 3, 4.

As an indication of their comparative values, it obviously will suffice if the most potent filtrate be compared with the most potent aggressin. According to recent data by Haslam and Lumb (p. 364), 5 c.c. doses of blackleg filtrate subcutaneously injected into calves protected them against subsequent infection with 10 c.c. doses of blackleg culture, which was sufficient to kill 100 guinea-pigs. It takes as much blackleg virus to kill a guinea-pig as it does to kill a calf. On this point the results of several investigators are in accord (see Table 1). It follows, therefore,

that the 5 c.c. doses of filtrate injected into calves by Haslam and Lumb (see Table 2) protected the calves against at least 100 minimal lethal doses for calves. Their statement (p. 365) "that the filtrates from four different laboratories possessed marked immunizing properties" is in accord with the results of numerous other investigators.

TABLE 1.—VIRULENCE OF BLACKLEG VIRUS

The number of cubic centimeters refers to blackleg culture, milligrams to dried muscle powder.

Investigators	Quantity of virus for 1 minimal lethal dose (MLD)	Animal killed
Franklin and Haslam, p. 413	0.02-0.1 c.c.	Guinea-pig.
		Rabits not killed by 1.5 c.c.
Nitta, p. 473	0.1-0.2 c.c.	Guinea-pig.
	0.1-0.5 c.c.	Calf.
Schobl, p. 10	0.1 c.c.	Guinea-pig.
Haslam and Lumb, p. 363	0.1 c.c.	do.
Ward, p. 400	0.05-0.1 c.c.	do.
Haslam, p. 541	0.1 c.c.	do.
Uchimura, p. 304	0.4 c.c.	White mouse.
	0.7 c.c.	Guinea-pig.
Do., p. 307	30 mg. powder	do.
Schoenleber, Haslam and Franklin, p. 3	2-2.5 mg.	do.
Do., p. 7	1 mg.	Calf.
Haslam and Franklin, p. 425	1,000 mg. (?)	"4 out of 8 calves satisfactory."
Harkins and Schneider, p. 89	6 mg.	Guinea-pig.
Graub and Zschokke, p. 60	0.5-20 mg.	Guinea-pig. Calves and sheep killed by ½ guinea-pig MLD. Used dried culture.
Berg	2.5 mg.	Guinea-pig. Virus must be at peak of virulence to kill at this dose. Larger doses generally required.

Among the high potency aggressins are those described by Haslam (p. 543) and by Ward (p. 400. See Table 3). Haslam states that "74 per cent of calves receiving 5 c.c. of blackleg aggressin were immune to 5 c.c. of pure culture virus. * * *

The virus used was of such strength that 0.1 c.c. would kill two out of three guinea-pigs in 48 hours." On the basis of these figures, 5 c.c. of aggressin protected calves against 50 minimal lethal doses of virus, while the same dose of filtrate protected against 100 minimal lethal doses.

Similar results were obtained by Ward. Five cubic centimeters of aggressin did not protect calves against 4 c.c. of virus, but 10 c.c. did. Since 0.05 c.c. virus killed guinea-pigs, the aggressin in 5 c.c. doses (calculated) protected calves against 40 minimal lethal doses of virus, a somewhat lower potency than

TABLE 2.—POTENCY OF BLACKLEG FILTRATES

Investigators	Dose of filtrate injected (c.c.)	Animal protected	Actual dose of virus	Calculated number of guinea-pig MLD against which 5 c.c. filtrate protected
Haslam and Lumb, p. 364	5	Calf	10 c.c.	100
Nitta, p. 476	0.5-2	Guinea-pig	0.2 c.c.	10
Do., p. 477	10	Calf	0.2 c.c.	1
Graub and Zschokke, p. 55	0.5-1	Guinea-pig	20 mg.	5-10
Do., p. 113	0.25-5	Sheep	10 mg.	10
Do., p. 119	3-20	Calf	10 mg.	1
Uchimura, p. 314	3	Guinea-pig	0.7 c.c. or 30 mg.	2
Kansas Agr. Expt. Sta., Director's Report, 1917-1918, p. 50	"Preliminary experiments show filtrate to be as good as vaccine for cattle immunization."			
Do., 1918-1919, p. 69	"The filtrate is as efficient as the natural aggressin."			
Berg	2	Guinea-pig	10 mg.	3
	5	Calf	5 c.c.	Over 200

that of Haslam's aggressin and considerably lower than that of several blackleg filtrates.

Taking the figures of the various investigators at their face value, and allowing all the potency claimed for each product, the available data indicate that between filtrate and aggressin, filtrates had the higher potency.

In Table 2 it is to be noted that the potencies of filtrates varied very widely. European workers were apparently satis-

fied with filtrates that immunized against one minimal lethal dose. They used weak virus. Shigley and Christopher (p. 330) showed that neither aggressin nor filtrate will protect against overwhelming doses (2 grams) of virus. When comparing potencies of filtrates with aggressins, those experiments in which very strong virus was used are of special significance, for against a weak virus almost any product may immunize. The potency of a product should therefore be calculated on the basis of protection conferred against the number of minimal lethal doses rather than against a number of cubic centimeters or milligrams of virus. Protection against virus which kills 9 out of 10 calves in 36 hours or less (Berg) is obviously better than protection against virus which requires 72 to 96 hours to kill 4 out

TABLE 3.—POTENCY OF BLACKLEG AGGRESSINS

Investigators	Dose of aggressin injected (c.c.)	Animal protected	Actual dose of virus	Calculated number of guinea-pig MLD against which 5 c.c. aggressin protected
Schoenleber, Haslam and Franklin, p. 7	8	Calf	1 mg.	1
Haslam and Lumb, p. 258	10	Guinea-pig	0.5 c.c.	3
Haslam, p. 543	5	Calf	5.0 c.c.	50
Ward, p. 400	10	do.	4.0 c.c.	40
	5	do.	4.0 c.c.	Calf died
Schobl, p. 12	0.5	Guinea-pig	20 mg.	10
Zschokke, p. 104	1-2	Calf	0.7 c.c.	5
	0.5-1	Guinea-pig	0.7 c.c.	10

of 8 calves. In none of the experiments recorded in the literature was as strong virus used as that used by Berg. In no other cases was death of calves from the virus in 36 hours or less recorded.

The results summarized in Table 3 indicate that different preparations of aggressin may vary greatly in potency. Schobl immunized guinea-pigs with 0.5 c.c. doses of aggressin, while Haslam and Lumb found 10 c.c. necessary, or 20 times as much. With 3 and 5 c.c. doses, 56 per cent and 67 per cent of guinea-pigs were protected. Such unusually large dosage indicates limited immunizing power.

TABLE 4.—POTENCY OF BLACKLEG SERUM

Investigators	Dose of serum injected (c.c.)	Animal protected	Actual dose of virus	Calculated number of guinea-pig MLD against which 5 c.c. serum protected
Schoenleber, Haslam and Franklin, p. 3	0.55	Guinea-pig	1,000 mg.	5,000
	15	Calf	250-1,000 mg.	150
Harkins and Schneider, p. 89	2	Guinea-pig	6 mg.	3
Uchimura, p. 308	200-300	Cattle		Curative dose
	1	Guinea-pig	0.7 c.c.	5

The remarkable results of Schoenleber, Haslam and Franklin with guinea-pigs that were protected by 0.55 c.c. doses of serum against 1,000 mg. of virus, of which 2 mg. was a fatal dose (Table 4), are difficult to understand, and should be confirmed if possible. That the unfiltered, spontaneously coagulated serum was but 12 hours old when injected into the guinea-pigs may be an explanation.

10. THIRTY-DAYS BLACKLEG FILTRATE

Preparation.—Virulent strains of *B. chauveaui* are grown for 30 or more days in a special culture medium. This is then filtered to remove all organisms and spores. The germ-free filtrate is the finished product.

Medium.—The medium used in the preparation of thirty-days blackleg filtrate differs from the usual media in the following respects: (1) It is sterilized by filtration and not by heat. In this way none of the nutrient materials in the medium are denatured by the excessive heat frequently necessary in heat sterilization. (2) Neither is the pH changed. Once the reaction of the medium is adjusted to pH 7.6, it is retained. (3) The constituents of the medium have been selected in the light of the best available data on the food and mineral requirements of bacteria in general and of the blackleg bacillus in particular.

The conditions are extremely favorable for the elaboration of aggressin. The organisms have a long time and are not opposed by leucocytes, bacteriolysins or other natural defenses present in living tissues.

After the growth period, the cultures are freed from organisms and spores by filtration. Tests are made on the cultures for purity, and on the filtrates for toxicity, sterility and potency. There is sufficient aggressin in a seven-day culture filtrate to protect calves against enormous doses of most virulent blackleg virus. In order to obtain a product having a maximum of protective power, the cultures are allowed to go on for 30 or more days, permitting further formation of aggressin. The final filtrate is a pale yellow, pleasant smelling, water-clear liquid, not poisonous, germ free, and contains an added preservative. The product will not spoil if the container be carefully opened and closed.

Limitations.—Technical skill, long time and intensive attention are required in the preparation of a medium which will support vigorous growth of the blackleg organisms for 30 or more days. Some of these are not required in the preparation of natural aggressin, since the young calf serves as a tank of ready-made medium.

11. SUMMARY

Practical tests warrant the conclusion that the potency of thirty-days blackleg filtrate is higher than that of any other blackleg immunizing product at present available.

The comparative data indicate that on the whole blackleg filtrates have been prepared having higher potencies than aggressins.

When making potency tests on guinea-pigs, sensitization resulted just as often as immunization. Which will happen could not be predicted. The use of such large doses as 10 c.c. of a product for immunizing one guinea-pig does not justify the claim made that the product is highly potent in immunizing calves.

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POSTMORTEM SETTLES SCOTTISH CONTROVERSY

A notable controversy in Scottish veterinary circles of several years ago, as to whether or not the Clydesdale mare "Sweet Bloom" was affected with ringbone, was recently settled by the death of the mare. In 1912 there was a lawsuit over the question and several veterinarians gave evidence on each side, some holding that the mare had ringbone and others that she did not. The court decision, following what seemed to be the preponderance of the evidence, was in the affirmative. A postmortem examination has disclosed no indication of ringbone. This outcome is a vindication of the opinion of Prof. J. R. McCall, of Glasgow, and those who agreed with him.

The development of Irish national consciousness is shown in an advertisement of the Veterinary College of Ireland, Ballsbridge, Dublin, which is printed first in what we suppose is Gaelic and then in English. The college is now in its twenty-third session. The advertisement does not state in what language the instruction is given.

THE REMOVAL OF HETERAKIDS FROM THE CECA OF CHICKENS BY RECTAL INJECTIONS OF ANTHELMINTICS

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EXCEPT for such cases as that of the horse, in which the cecum has two openings, thereby insuring the entrance of drugs into it whenever the drugs pass the ileocecal valve, it is a difficult matter to remove worms from the cecum of an animal, owing, apparently, to the passage of the drug from the ileum into the colon and its failure to enter the cecum. In general, tests on such animals as dogs show that various anthelmintics, sometimes comparatively feeble drugs, will occasionally remove whipworms from the cecum, but that more often these and more potent anthelmintics will entirely fail to remove whipworms. It has therefore seemed necessary to use repeated doses of some drug which is not a gastrointestinal irritant or else a drug which can be used with safety in large amounts in order to insure by the number of doses or the bulk of the drug that it enters the cecum. For repeated doses santonin is perhaps our best drug; of the bulky drugs leche de higueron, the latex of a South and Central American fig, seems to be the most effective drug for removing whipworms.

In the case of most of the domestic animals rectal administration of drugs to remove worms from the cecum does not seem to be feasible or advisable. It is unnecessary in the case of the horse, since this cecum has two openings as already noted, and it is probably not feasible. It hardly appears feasible or advisable in the case of cattle. In the case of sheep, Brumpt, according to Railliet (1915), has used rectal injections of thymol successfully for the removal of whipworms from the cecum, but the technique is such that few American veterinarians would regard it as a feasible procedure. In the case of swine it would be a difficult matter to flood the cecum by means of rectal injections. In the case of the dog rectal injections prolonged to the point where the injected fluid is vomited, or what is called gastrointestinal lavage, has been used to some extent for the

removal of worms. Hall and Wigdor (1918) found that this lavage method, using tap water or soap solution, removed all the whipworms from two dogs and left them all in two dogs. It is probable that the use of suitable anthelmintic solutions would increase this efficacy and a quite satisfactory method of treatment in this manner might be developed for the removal of whipworms from dogs. In the case of man some writers, as Hurst (1922), state that enemas (of 1.5 pints of fluid) properly injected will invariably reach the cecum, and it might prove satisfactory to administer suitable anthelmintics by enema for the removal of whipworms from the cecum in man. However, the vermiform appendix is a complication, and such a treatment does not appear to have been attempted.

The case of chickens is a special case, somewhat different from those of the foregoing animals. The portion of the large intestine extending posteriorly from the union of the small intestine and the ceca is quite short, and Browne (1922), in a paper on the physiology of chickens, has recently noted that the ceca are easily injected by the injection of an ounce of fluid into the terminus of the intestine at the cloaca. He notes that this may be accomplished by using an ordinary enema syringe, the fluid apparently being driven immediately along the entire length of the ceca without resistance, and suggests that it should be possible to treat chickens for the removal of parasites from the ceca in this manner. The nozzle of the syringe is passed along the floor of the cloaca into the intestine, and the fluids should be injected slowly, using gentle pressure.

Browne's findings in regard to the physiology of the ceca seem to support amply his recommendations in regard to rectal injections as a logical method of treatment for the removal of worms situated here. Tests of various drugs by Hall and Foster (1918) indicated that it was as difficult to remove worms from the ceca of chickens as from the cecum of the dog or other mammals when the drug was given by mouth. They succeeded in removing only 20 of 389 *Heterakis papillosa,* or 5 per cent, with areca nut; 10 of 463, or 2 per cent, with turpentine; 2 of 349, or 0.6 per cent, with chenopodium; and 30 of 162, or 19 per cent, with a decoction of tobacco stems. In view of these facts we undertook to test this proposed method of administering anthelmintics by rectal injections and carried out experiments with

birds weighing about 1.5 pounds each, using carbon tetrachlorid, copper sulphate, chenopodium and turpentine as follows:

Using carbon tetrachlorid (C.P.), six chickens were injected, the amounts and the results being as follows:

No. 14, 10 c.c. Passed 79 worms (*H. papillosa*). Postmortem, 0 worms. Efficacy, 100 per cent.
No. 15, 10 c.c. Passed 2 worms. Postmortem, 0 worms. Efficacy, 100 per cent.
No. 16, 5 c.c. Passed 1 worm. Postmortem, 0 worms. Efficacy, 100 per cent.
No. 17, 5 c.c. Passed 0 worms. Postmortem, 10 worms. Efficacy, 0 per cent.
No. 18, 3 c.c. Passed 24 worms. Postmortem, 70 worms. Efficacy, 25.5 per cent.
No. 19, 2 c.c. Passed 41 worms. Postmortem, 0 worms. Efficacy, 100 per cent.
Total worms passed, 147; total not passed, 80; per cent removed, 65.

Of the 6 birds, 4, or 66.6 per cent, had all their worms removed. While the smallest dose, 2 c.c., was as effective as the largest dose, the removal of all the worms present seems more certain where the larger doses are used.

Using 1 per cent solution of copper sulphate, six chickens were injected, the amounts and the results for the first two days being as follows:

No. 20, 10 c.c. Passed 0 worms. Postmortem, 50 worms. Efficacy, 0 per cent.
No. 21, 10 c.c. Passed 2 worms. Postmortem, 0 worms. Efficacy, 100 per cent.
No. 22, 5 c.c. Passed 1 worm. Postmortem, 46 worms. Efficacy, 2 per cent.
No. 23, 5 c.c. Passed 0 worms. Postmortem, 34 worms. Efficacy, 0 per cent.
No. 24, 3 c.c. Passed 0 worms. Postmortem, 10 worms. Efficacy, 0 per cent.
No. 25, 2 c.c. Passed 0 worms. Postmortem, 16 worms. Efficacy, 0 per cent.

These birds passed a total of 3 worms and had 156 postmortem, the treatment being less than 2 per cent effective. To the indicated total of 159 worms should be added 4 removed later by arecolin hydrobromid.

As our tests show that all the heterakids will come away during the first two days, these birds were given arecolin hydrobromid the third day after the copper sulphate treatment, and subsequently passed a total of 4 heterakids, a result slightly better than with the copper sulphate, but yet so slight as to show that this drug also is of no value for removing these worms. In

passing we may say that the experiments with arecolin hydrobromid indicate that this drug, which has become extensively used for removing tapeworms from dogs, is ineffective in removing tapeworms from poultry.

Using oil of chenopodium, dissolved in 5 c.c. of cottonseed oil, six chickens were injected, the amounts and the results being as follows:

No. 26, 1 c.c. Passed 15 worms. Bird showed toxic symptoms soon after injection and was found dead the following day. Postmortem, 9 worms. Efficacy uncertain, as worms usually pass for two days, and the death of the bird terminated the experiment too soon to permit of conclusions.

No. 27, 0.5 c.c. Passed 17 worms. Postmortem, 4 worms. Efficacy, 81 per cent.

No. 28, 0.4 c.c. Passed 4 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

No. 29, 0.3 c.c. Passed 9 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

No. 30, 0.2 c.c. Passed 14 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

No. 31, 0.1 c.c. Passed 1 worm. Postmortem, 0 worm. Efficacy, 100 per cent.

Leaving out bird No. 26, which died, these birds passed a total of 45 worms and had 4 left postmortem, an efficacy of almost 92 per cent. In view of the death of bird No. 26 we may conclude that 1 c.c. of oil of chenopodium by rectal injection is lethal for birds weighing about 1.5 pounds.

Since the tests of chenopodium gave satisfactory results when small doses were used, an additional series of four birds was injected with the smallest dose, 0.1 c.c., used in the previous series, the chenopodium being dissolved in 5 c.c. of cottonseed oil, with the following results:

No. 32. Passed 49 worms. Postmortem, 11 worms. Efficacy, 81 per cent.

No. 33. Passed 42 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

No. 34. Passed 2 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

No. 35. Passed 4 worms. Postmortem, 0 worms. Efficacy, 100 per cent.

These birds passed a total of 97 worms and had 11 postmortem, an efficacy of practically 90 per cent, or substantially the same efficacy as was shown in the previous experiment.

Combining the figures for the 10 birds given oil of chenpodium shows that they passed 142 worms and had 15 postmortem, an

efficacy of over 90 per cent. As drugs showing an efficacy of 90 per cent in single-dose treatment in the removal of worms from animals may be regarded as quite effective, it is evident that we have in oil of chenopodium a satisfactory drug for the removal of heterakids from the ceca of chickens. A dose of 0.1 c.c. of this drug in 5 c.c. of a bland oil, such as cottonseed oil, is sufficient for birds weighing 1.5 pounds, and in all probability a dose of 0.2 c.c. in 10 c.c. of a bland oil would be a satisfactory dose for the removal of these worms from adult birds weighing 3 pounds or more. As rectal injections are substantially as simple as the administration of drugs by mouth, this method of treatment by means of rectal injections of oil of chenopodium in a bland oil appears to solve the problem of removing heterakids from the ceca of poultry.

Inasmuch as turpentine behaves in many respects like oil of chenopodium in removing worms, but requires distinctly larger doses to secure somewhat inferior results in such animals as the horse, experiments were made with turpentine in 5 c.c. of cottonseed oil on a series of six chickens, the amounts of turpentine and the results being as follows:

No. 36, 0.2 c.c. Passed 0 worms. Postmortem, 291 worms. Efficacy, 0 per cent.
No. 37, 0.2 c.c. Passed 0 worms. Postmortem, 32 worms. Efficacy, 0 per cent.
No. 38, 0.5 c.c. Passed 0 worms. Postmortem, 9 worms. Efficacy, 0 per cent.
No. 39, 0.5 c.c. Passed 31 worms. Postmortem, 68 worms. Efficacy, 31 per cent.
No. 40, 1 c.c. Passed 2 worms. Postmortem, 82 worms. Efficacy, 2 per cent.
No. 41, 1 c.c. Passed 0 worms. Postmortem, 102 worms. Efficacy, 0 per cent.

These birds passed a total of 33 worms and had 584 postmortem, an efficacy of about 5 per cent. It is evident, therefore, that turpentine in doses up to 1 c.c. is distinctly inferior to oil of chenopodium for the removal of heterakids from the ceca of poultry by means of rectal injections.

It seems advisable to discuss briefly in this connection the question of the importance of *Heterakis papillosa*, since the question might be raised as to whether it is worth while to treat chickens by rectal injections to remove these worms. Here as elsewhere the cost of treatment must be balanced against the

loss from failure to treat infested birds. These worms are sometimes present in enormous numbers, and Railliet states that he has known them to cause a fatal typhlitis. For such extreme cases there is a range of decreasing injury to the point where few worms are present and no pathological symptoms or lesions are evident. The symptoms which have been associated with heavy infestations are malnutrition, unthriftiness, drooping wings, dullness, and digestive disturbances, especially the occurrence of a profuse diarrhea. Larvæ have been found in nodules and in verrucous growths of the ceca, according to Galli-Valerio and to Letulle and Marotel. According to Graybill (1921) and to Uribe (1922), the larvæ occur in the mucosa. The eggs hatch in the small intestine, the larvæ pass to the large intestine and then enter the ceca, being found in the cecal contents 24 hours after the worm eggs are fed to birds. The worms then enter the cecal glands and are found here from the second to the fifth day. Subsequent development takes place in the lumen of the cecum. About the ninth day the worms may be found in some cases with the anterior third of the body inserted in the cecal glands, causing some slight damage to their epithelium. Worms are sometimes found in the enlarged cavities of the lymph nodules, and they may cause minute injuries of the cecal mucosa.

In connection with this habit of invading the structures in the walls of the ceca, the findings of Graybill and Smith (1920) are of especial interest. These writers found that when infective blackhead material was fed to birds in connection with the feeding of embryonated eggs of *H. papillosa,* blackhead would develop, whereas the feeding of the blackhead material alone would fail to develop the disease. This indicates that these worms have, at least at times, some indirect etiological relationship to blackhead disease, perhaps serving as inoculating agents for the organism responsible for this disease, possibly by conveying this organism into the cecal glands in entering these glands during the period of larval development.

In view of the lesions produced by the worm alone and of its relation to the production of so serious a disease as blackhead, the treatment of birds by means of rectal injections for the removal of these worms seems to be well warranted.

SUMMARY AND CONCLUSIONS

1. Experiments to determine the efficacy of rectal injections for the removal of the common heterakid, *Heterakis papillosa*, from the ceca of chickens were carried out as follows: With carbon tetrachlorid in doses of 2 to 10 c.c. on 6 birds, with an efficacy of 66.6 per cent; with 1 per cent aqueous solution of copper sulphate in doses of 2 to 10 c.c. on 6 birds, with an efficacy of less than 2 per cent; with oil of chenopodium in doses of 0.1 to 1 c.c. in 5 c.c. of bland oil on 10 birds, with an efficacy of approximately 90 per cent; with turpentine in doses of 0.2 to 1 c.c. in 5 c.c. of bland oil on 6 birds, with an efficacy of 5 per cent.

2. Heterakids can not be removed from the ceca of poultry with any degree of certinty by means of drugs administered by mouth, but can be readily removed by means of rectal injections of oil of chenopodium, given with a hard rubber enema syringe, in doses of 0.1 c.c. in 5 c.c. of bland oil in the case of birds weighing 1.5 pounds, and double this amount of chenopodium and oil would probably be substantially as effective for adult birds weighing 3 pounds or more.

3. In view of the damage credited to these worms in massive infestations and of their indicated association with the causative organism of blackhead disease in the production of this disease, the use of the comparatively simple method of treatment by rectal injections for the removal of these worms appears to be warranted.

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LITTLE—BUT O MY!

Here's to the chigger,
The bug that's no bigger
Than the point of a good-sized pin.
But the point that he raises
Itches like blazes,
And that's where the rub comes in.

—*Denison Flamingo.*

A CHEMICAL DIE-T

O chemist of skill, investigate!
Answer this quiz of mine:
I think I know what Carbonate,
But where did Iodine?

—*Lehigh Burr.*

Of that swell place where Carbonate,
The news has now spread wide;
It's just the place where Sulphuret,
And where poor Iodide.

—*Journal A. M. A.*

It is harder to remove a colon than a semicolon.—*Journal A. M. A.*

Blue eggs are said to be laid by an Argentine variety of hens known as Arsucana.

Advertisement in a New York State newspaper: "For Sale—Seven cows and Jersey bull; fresh and coming in."

CONSTIPATION IN THE DOG: ITS CAUSES AND TREATMENT

By Oscar Schreck, *New Haven, Connecticut*

DEFINITION.—Constipation is an undue, unnatural retention, or retardation, in the natural evacuation of the bowels.

I am aware that the subject chosen for consideration is a commonplace one, and has been thrashed out by authors great and small; yet I doubt whether all grains have been separated from the chaff, as far as the dog and the cat are concerned. If in active veterinary practice (small-animal practice) there is one condition which calls for the veterinarian's aid more often than anything else, it is constipation.

How often has it been said that constipation is the one great affection and drawback of the small-animal practice? In fact, it is one of the greatest drawbacks of the rapid advancement of the small-animal practice. The animals suffering from this diseased condition are sluggish and dull. I know of no disease in which proper treatment affords the animal so much good as that of constipation.

Among the many derangements of the animal functions to which the dog and the cat are heirs, there is not one more common, except digestive troubles (and even here improper digestion is the starting point in many cases of constipation), as seen in the small animals. And none is more chronic or more disastrous in its effects upon the general health of the animal. To enumerate all the complaints in which constipation may occur would require me to pass in review the majority of all the affections of the animal body. It behooves us to remember the natural tendency of the dog toward constipation. This ailment embraces among its victims those of both sexes, and is seen at all ages, but perhaps more in the lap dog. The remote effects of the subject under consideration, as veterinarians know, are far more numerous and serious than is commonly understood by the animal owner.

An unclean alimentary canal is often, and without doubt, an important factor in the causation of epilepsy, anemia, vertigo, hysteria, skin diseases, etc., although the dog and cat owner is

often prone to overlook so humble an origin for causation data. But we know by observation and study that the above diseases have their most frequent origin in protracted retention of the animal feces. It is an insidious evil, and at the same time undermines the general health of the animal. The eliminative process is an essential factor in digestion, and on its proper functioning depends the welfare of the entire animal system. The alimentary canal extends from the mouth to the anus, and as has been shown in Stuttgart, Germany, at a health exhibit, by diagram, the dog's intestinal canal is four and a half times the length of its head and body. Its different parts bear different names, and bear special functions in the animal economy. These divisions in anatomical order are: Mouth, throat, esophagus, stomach, small intestines, large intestines, and rectum.

The mouth receives the food, the throat and esophagus convey the food to the stomach, and the duodenum receives the alimentary mass out of the stomach. The small intestines assist in digestion and absorption. The unappropriated food passes into the large intestines, where absorption also takes place to some extent; and here is where our trouble is found, and in the rectum of the animal. One of the points we must agree upon is that 90 per cent of dog diseases are directly traceable to intestinal putrefaction of stomach waste due to inactivity of the bowels, or the resulting constipation.

This indigestible residue from the food, together with certain other elements of waste of the body, constitutes the animal feces. The function of the colon and rectum is to receive and cast off this accumulation by the act of defecation, through the backward movement toward the rectum, or peristalsis, and upon this movement depends the passage of nutritive and fecal matter along the bowels. But if for any reason there is any interference with this normal function, constipation is the result, failing to secure daily evacuations of the bowels, and we have absorption of poisons that ought to be thrown off from the animal body as well as in man. For how can the animal be in health when this door of nature is closed, or through ignorance or indifference, or both, on the part of the owner, time is allowed to slip by without letting the animal attend to nature's necessities in this direction? This cause is often seen in well house-broken animals, and this

is one of the evils arising in the cat and dog resulting in constipation.

The consequences of troublesome and prolonged constipation should be stated to the owner of the animal and the importance of proper care of the bowels drawn to his attention. In taking into consideration the above, it would not be a great stretch of imagination to picture this long intestinal sewer as containing a large amount of decomposing material, which is admittedly a very ideal breeding ground for a large number of different kinds of germs that are said to be the cause of different diseases, and as such require as much attention in the animal as the plumbing in one's dwelling.

Again, the term constipation is a relative one, and the line of demarcation between what is physiologic and that which is pathologic, in a given case, many times can only be drawn by a thorough study and knowledge of the individual animal.

MORBID ANATOMY

There are no morbid changes characteristic of constipation. Dilatation of the colon in various degrees, sometimes enormous, depending on circumstances. Impaction with the retained feces in the intestines is known as coprostasis, and there may be found remnants of inflammation or other local lesions that may be the primary factor in the bowel obstruction.

ETIOLOGY

The causes of constipation are as numerous as are its untoward consequences, since it may be owing to, or the result of, a wide range of abnormal conditions. In fact, what morbid condition may not terminate in constipation? The most immediate causes of this affection in the small animals are atony, resulting in slowness of peristalsis. This is chiefly caused by the animal being confined so as to not be able to meet the requirements of nature's call for relief. Therefore this disease is seen quite often in house-broken dogs. Also other immediate causes are impaired or torpid action of the liver, in consequence of which there is either a deficient or a vitiated secretion of bile. Also torpor of the muscular coat of the alimentary canal itself, and more especially of that portion of it which constitutes the large intestines. Also the production and accumulation of flatus in these organs, by which their thin parietes are distended. Or a loss of

muscular power in the abdominal wall itself from overdistention, affording a mechanical obstacle to the passage of the feces. Also errors in the management of feeding and exercise; deficiency or a faulty composition of the intestinal secretions; or upon disorders of those neighboring glands that pour their secretion into the intestines, especially bile.

The feeble, aged and pregnant bitch is predisposed to constipation. Lack of contractile power in the abdominal muscles from any cause may also induce constipation. Also anemia, and protracted illness, like distemper. Also food improper in quantity and unwholesome in composition, etc. Also starving, lack of drinking water, faulty secretion of digestive fluids, irregular feeding, especially house pets or lap dogs; lack of exercise, confinement, overfeeding (obesity), and faulty mastication of foods, are all factors in the causation of constipation; such as bolting of food, etc.; also unfavorable surroundings, foreign bodies, such as wood, bones, marbles, corks, sponges, etc., blocking the feces in the bowel, and as a result delaying the natural course of the feces.

Twisted or knotted intestines (small intestines) favor conditions causing undue elimination of fluids by the kidneys, such as occurs in diabetes, where large quantities of fluid are carried off by the kidneys. And in some cases the long-continued use of cathartics is a frequent cause of obstinate constipation. Also inflammation of the digestive organs, and the supply of blood to the parts, inflammation by extension, and in the pup or kitten, atresia ani.

But in the majority of instances constipation in the dog is due to a deficiency in the peristalsis of the large intestines, from any cause. The writer has known constipation to be caused by the change of ownership, thus changing the animal's diet, habits, etc. Diseases of the stomach sometimes make it impossible for the dog or cat to eat and not vomit, and when this exists it is apt to be associated with constipation. Also when the absorption from the intestinal canal is too active, and the quantity small, and the residue left as fecal matter is small, and for that reason passes along the intestines very slowly, and the feces become dry, hard and clayey.

Other causes are external obstruction, such as sticking or matting of hair (called false constipation), and the sequelæ of

stomach and intestinal catarrh, that generally show a lack of intestinal juices, as heretofore stated; and the result is a reduced activity of reflex movement of the intestines, seen in chorea, paralysis, tetanus, etc. Therefore if constipation of the dog or cat, from whatever cause, be neglected, the sensitive nerve elements supplying the mucous membrane of the bowel soon are obtunded and gradually become blunted, while the muscular coat of the colon undergoes atrophic changes, and peristaltic movements grow weak and ineffective. The outward movement of the intestinal contents grows more and more sluggish, and unless prompt and effective treatment is brought to bear upon the condition the animal will be the victim of constipation that will to the utmost tax the skill of the veterinarian to correct. I know of no diseased condition of the animal body that is so prone to produce autotoxemia, or I might say, self-intoxication, as is constipation, because, in stasis, the intestinal canal becomes a veritable hotbed for the development and multiplication of pathogenic germs, while the conditions are present for the rapid absorption of their poisonous toxins.

Bread, dog biscuits and dry, innutritious foods if given excessively, or an oversupply of bones, without change, is many times a causation factor. Constipation is also seen as a symptom of certain febrile diseases acting reflexly. Also jaundice by its lack of bile, and in the bitch increased lactation are also causes.

SYMPTOMS

The first symptom noticed will be the animal trying to evacuate, and moving from place to place straining, at times painful efforts being in evidence. The animal may succeed in passing a small, dry, hard, chalk-colored ball of excrement, containing at times undigested pieces of the animal's food, and giving off a very offensive odor.

The abdomen is seen in some cases to be somewhat distended, and perhaps painful on pressure. If the large intestine is distended, irritation along the genito-urinary tract may also be caused. The carriage of the animal's tail is straight out, bending only at the root, and is very characteristic and pathognomic. Vomiting is often seen, first, of the substances contained in the stomach, or of bilious fluid, and as the case progresses, of stercoraceous matter.

The animal becomes gradually exhausted, with quick, small pulse, and cold skin, from faulty circulation. But these latter symptoms are seen more in complete intestinal obstruction. Then we have in all cases an offensive odor of breath, conjunctiva of the eyes injected, loss of appetite, vertigo, etc. Eruptions such as eczema and urticaria often appear upon the skin, with dullness of the eyes. In chronic cases the animal is also subject to fits and temporary loss of consciousness. In some cases of prolonged constipation there is also diarrhea from irritation of the mucous membrane produced by the fecal mass. Pressure on the biliary duct may cause an obstructive jaundice, and is quite common in the small animals, and is a very troublesome and dangerous disease. By palpation the impacted mass may be detected along the line of the intestine. And last, though not least, in many cases there is an irritable temper of the affected animal.

The usual termination of constipation when severe, frequent, and obstinate, is in inflammation of the intestines, which commonly assumes enteritis, which in many cases rapidly proves fatal; or the perforation of the dilated and weakened intestinal wall, with or without ulceration, may cause fatal peritonitis.

TREATMENT

As this is the most frequent physical disorder of the canine and feline animals, and also the most mismanaged of all disturbances, the owner should be instructed that the way to cure constipation is to prevent it. Each case of constipation should be carefully studied so as to determine if possible the cause, and its removal if possible. Therefore we should not leave a stone unturned in our search for discovering its cause. The first question of the medicinal treatment is with what remedy or means can we do the most good for our patient. The habitual giving the animal purgative medicines by some owners is very injurious, and increases the evil in the animal as well as in man. Drugs are not intended to cure constipation. Drugs do no more than empty the bowels. They do not and can not cure, because the trouble is one of disturbed metabolism, and disturbed metabolism results in most cases in the small animals from insidious digestive insufficiency from whatever cause.

The chief object to accomplish is to lay stress upon the treat-

ment of constipation by other then medicinal means as far as possible. It is not often that the veterinarian is consulted for simple constipation in the small animals. Care, diet and exercise are usually all that is required to keep the bowels open. But if mechanical means, diet, exercise, etc., fail to overcome the constipation, recourse must be had to medicinal agents.

In using drugs in order to bring about exacuation, there is a choice as to the least harmful, and such should be used, for some drugs affect the whole length of the intestine, while others make their impressions only upon particular portions, and the choice should be made with reference to its after effect.

Before giving powerful drugs try oleum ricini, oleum olivæ, or equal parts of each. An enema of plain warm water is preferred (but not as a curative measure, for it is simply to empty the bowels at the time, and it certainly tends to soften them). The writer also recommends the injection of one or two drams of glycerin into the rectum, and it certainly is a good aperient, and in many cases has produced an easy action when other means have failed. It is claimed that its action is due to a withdrawal of the water from the blood vessels of the bowels.

Exercise should not be forgotten, with good judgment as to the amount and the condition of the animal. Feed carefully, and regulate diet, as hereinafter stated. After you have softened the mass, a compound cathartic pill may be used. But let me impress upon your mind again that a cathartic will not cure constipation unless you remove the cause. To the layman a cathartic is simply a cathartic and nothing more. One thing is as good as another, so long as it moves the bowels. To the veterinarian of today there is a vast difference between "moving the bowels" and inducing normal bowel action if possible. Attention is called to the contradistinction between obstipation and constipation of the intestinal tract. In obstipation there is a normal frictional activity, but there is some deformity, growth, constriction, flexion or foreign body in the intestinal canal which offers a mechanical obstruction to the passage of the fecal current. These distinctions must be borne in mind, for while they may present similar symptoms in the animal, the treatment is entirely different.

Most owners of small animals will treat the ailment themselves, and what is everybody's business is nobody's business.

Everybody as a rule treats the case before the veterinarian sees the case, or treats at it, and the animal is made worse by such treatment. In many cases men and women who would not meddle with a watch or a piano do not hesitate to treat the human and animal bodies. As I have said, each case is a study of itself. If all cases are treated precisely alike in all details, it is probable that one of them is treated wrong. We should always have in view two objects in treating this ailment: (1) The immediate removal of the impacted mass; (2) the change of the pathological condition of the animal system in general, or of the alimentary canal in particular, on which fecal retention depends.

All conditions, general or local, which interfere with the health of the individual animal should be removed. The animal should have a supply of cool, fresh drinking water at all times, and nothing but soft food should be given, with exercise to stimulate peristalsis.

Certain cases may often be corrected by confining the animal to a liquid diet, as soon as impairment is noticed, such as oatmeal water and milk with the cream removed. Salted food is to be avoided. The food should be well cut up if hard food is given. Buttermilk is a wholesome beverage for the animal as a food and drink.

Bread, dog biscuits, and dry, innutritious foods, if given excessively, or an oversupply of bones, without change, is many times a causation factor. Corn bread and meal when properly made and fed to the animal is a sweet, healthful and laxative food for the dog in this condition, and while it is very nutritious, and containing oily materials, and yielding more substance to the animal heat, it should rarely be used as an exclusive article of diet, but it is indicated as stated above. A meal of corn meal three times a week is highly beneficial. The medicinal effects arise, in part, from the roughness of the particles of meal gently irritating the surface of the intestines along which it passes, causing the intestine to pour out a more copious supply of fluid, which gradually is accumulating in the intestines, and acts on the principle of an injection, namely, by the distention which it occasions, and the consequent reaction of the contraction which expels the contents of the bowels. Rice in any form is a good anticonstipation item of the animal dietary, and an ideal nerve

food, in these cases. Boiled liver is very useful once a week, or when the animal is off his feed, and acts as a laxative. It is not intended, however, by the writer as a regular diet.

When a large fecal mass becomes impacted in the posterior bowel, it will often have to be scooped out with the finger or rectal scoop assisted by injecting hot water and glycerin solution against the mass before attempting to remove it. An enema is an adjuvant in treating all forms of constipation, where there is evidence of a large fecal accumulation in the posterior bowel, such being the condition generally in the lower animal.

When a chronic, local morbid process is at the bottom of, or complicates, the affection, it may resist every kind of treatment until the local disorder is removed. To bring results from medicinal treatment, I have used phenolphthalein and agar, also mineral oils in milk, with good results.

The following prescriptions have given me the best results when I was compelled to use drugs:

Aloini	gr. v	or	.32 gram
Fellis bovis insp.	dr. ss	"	1.95 "
Resinæ podoph.	gr. ii	"	.32 "
Ipecacuanha	gr. ii	"	.13 "
Misce et fiat capsulas	No. xxv		

Sigma: One or two capsules three times a day for a large dog. One for a small dog.

Indications: Useful in constipation.

Aloini	gr. x	or	.60 gram
Asafœtidæ	gr. xi	"	2.60 "
Misce et fiat pilulæ	No. xx		

Sigma: One to two pills late at night.

Indications: Used in constipation with flatulency in case of old animals.

Strychnine sulphatis	gr. 1/100	or	.00065 gram
Aloini	gr. 1/3	"	.20 "
Powdered ipecac	gr. 1/10	"	.006 "
Ext. belladonnæ	gr. 1/10	"	.006 "

One such tablet should be given after feeding at night, and not on an empty stomach. If it acts in the night when given at this time, it may be given later, but not on an empty stomach.

For chronic cases the following is very useful:

Ext. belladonnæ	gr. ii	or	.13 gram
Ext. nucis vom.	gr. iv	"	.25 "
Ext. Bar. Aloes	dr. ss	"	1.95 "
Misce et fiat capsules	No. xxv		

Sigma: One capsule late at night.

The above treatment will be of no help whatever if the animal is not allowed to attend to the calls of animal nature with exercise.

In the cat I find nothing better than hydrargyri, in one bold dose.

In cases of constipation where a very strong agent is required, recourse must sometimes be had to croton oil.

Senna is a safe and excellent purgative for the dog and cat, and the syrupi of it has the advantage especially for administration to small animals.

Kansas has more cattle than any one of 45 other States, and more hogs than 38 other States. Three-fourths of the cattle are beef animals.—*Kansas Farmer.*

As an aid to combating dourine in Belgium, a decree has been issued requiring that all stallions aged 30 months or over be subjected to the complement-fixation test before January 1, 1923.

We need more constructive and more persistent breeders of good livestock in this country. . . . Now is the time to start because first-class foundation stock can be secured at most reasonable prices.—*Pacific Homestead.*

A recent issue of *National Stockman and Farmer* says: "A thermos bottle of freight-car size carried milk from New York City to St. Paul with a change of only 2 degrees in temperature," and asks "Will it transfer a part of the milk industry to regions more remote from great centers of population? Will it put the dairy cow on cheaper lands now occupied by other livestock?"

The vital point that is just beginning to seep into the consciousness of Argentine stockmen is that herd health and sanitation play a big factor in success. Professor Humphrey saw at Buenos Aires animals on exhibition with foot-and-mouth disease, and tuberculosis is rampant there. . Who knows but that Wisconsin may become the guiding star of Argentina in the development of dairy matters?—*Wisconsin Farmer.*

NECROBACILLOSIS IN SWINE [1]

By W. L. Clark
Seneca Falls, New York

NECROTIC ENTERITIS is the most fatal form of necrobacillosis and can be recognized with certainty by postmortem examination. The mucosa of the intestines is covered with a yellowish white material of cheese-like consistency, which may be removed by gentle scraping. The accumulation of exudate on the intestinal lining interferes with function and causes malnutrition, diarrhea and emaciation. In this form of necrobacillosis there are observed nervous symptoms, such as spasms, holding the head to one side, and walking or running in a circle. Growth is retarded indefinitely. If the animal escapes death it is rendered unprofitable.

Predisposing factors leading to the development of necrotic enteritis are digestive disturbances in suckling pigs caused by overfeeding sows, intestinal parasites, inferior feeding material and the feeding of caustic minerals or lye. Such conditions should be corrected when found.

The lesions of intestinal necrobacillosis closely resemble the button-like ulcers of hog cholera and necrotic enteritis may occur as a secondary infection in hog cholera. The areas in necrotic enteritis are non-elevated and diffuse, while those of hog cholera are circumscribed, well defined, and project above the surface of the mucosa.

Treatment

Where the lesions are accessible as on the face, the first stage of treatment should consist in the removal of all necrotic material with a sharp curette. Then take a swab and apply tincture of iodin. After this prepare a powder composed of boric acid and chlorinated lime equal parts and rub into the ulcerated tissue. A few applications will usually overcome the trouble. In the early stages the only evidence of disease may be a swelling of the tissue around the mouth. Upon close examination a

[1] Presented at the thirteenth semi-annual meeting of the Central New York Veterinary Medical Association, Syracuse, N. Y., November 8, 1922.

small scab may be revealed. This may be removed and treated as above. This treatment has given very successful results.

The intestinal form of the disease may be treated with any intestinal antiseptic or you may give a 3 per cent solution of the boric acid and chlorinated lime.

ERADICATION OF TUBERCULOSIS IN CATTLE

Australia is the latest convert to a scheme initiated in the United States and since adopted in Canada for dealing with tuberculosis in cattle. A memorandum from Col. J. A. Gilruth, D. V. Sc., Administrator of the Northern Territory of Australia, explains the accredited-herd system, the aim of which is first to get rid of tuberculosis in a purebred herd of cattle, and when this has been done to give the owner the advantage of having his herd placed on an official list of tuberculosis-free herds. The list of certified tuberculosis-free herds continues to grow in the United States, and from a recent communication from Dr. Frederick Torrance, D. V. Sc., the Veterinary Director General of Canada, we learn that the system is making good progress also in the Dominion. This country lags behind. The Tuberculosis of Animals Order did good work while it was in operation, but has been suspended since 1914. It is time our authorities gave their attention to its revival or to some alternative scheme such as the one outlined.—*The Lancet, London.*

The Finance Committee of the French Chamber of Deputies in reporting the budget for 1923 proposed a reduction in the appropriation for the Toulouse Veterinary School which would have amounted to the suppression of the school. The proposal was made as a measure of governmental economy and in view of the falling off in the number of students since the war, it being considered that the schools at Alfort and Lyons were sufficient for the needs for veterinary education, and also because the buildings of the Toulouse school will probably have to be demolished to make way for the enlargement of the railway station. The people of Toulouse and surrounding country, however, protested so vigorously that the appropriation was restored.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

A GRANULOMATOUS CONDITION CLINICALLY SIMULATING GLANDERS

By L. P. Doyle *and* G. H. Roberts

Purdue University Agricultural Experiment Station, Lafayette, Indiana

PATIENT.—A brown male grade Percheron colt, 2½ years old.

History.—The colt was on pasture with other colts until August 1, 1921. Although some of the symptoms shown suggested glanders, the colt had not been off the farm and no new horses had been introduced into the herd since he was born. In fact no history was found that would indicate a possible chance for glanderous infection.

Symptoms.—The early symptoms were anorexia, a slight rise in temperature, and cough that could easily be excited by a pressure on the larnynx. The conjunctival and Schneiderian membranes were slightly congested. There was a slight purulent discharge from the eyes and nostrils. There were no visible ulcers on the Schneiderian mucous membrane. There was a patchy exanthematous dermatitis. The most outstanding symptom was the enlarged, nodulated submaxillary lymph glands, resembling a condition so often found in typical cases of glanders.

The colt was isolated at once and the mallein test applied, with negative results. A sample of blood was collected and sent to the Bureau of Animal Industry at Washington, D. C., for examination for glanders. A microscopic examination of the blood showed a polynuclear leukocytosis.

The treatment consisted of tonics and two-dram doses of iodid of potash morning and evening. In September, or approximately two months later, during the period of shedding the coat, large areas of the skin became depigmented and the hair came in white over the depigmented areas. There were white patches

Fig. 1—Colt, showing depigmented and depilated areas over its body

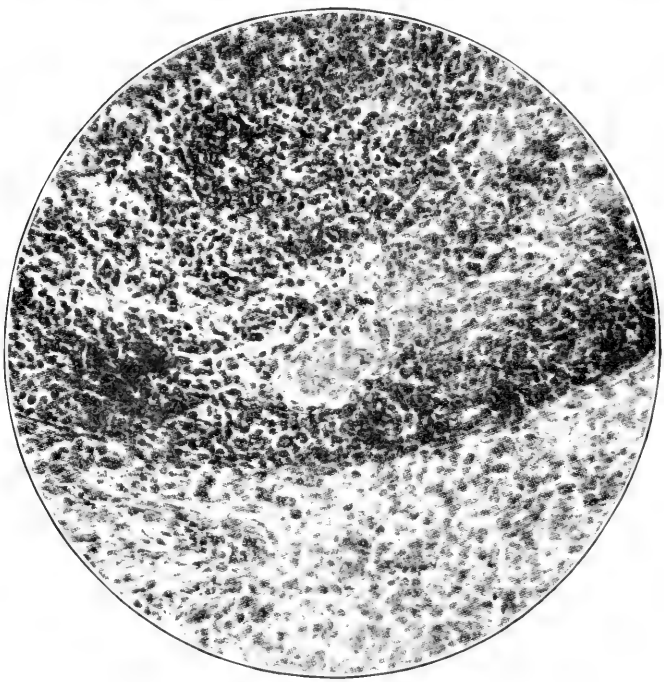

Fig. 2—Section of lymph gland, showing a clump of epithelioid cells in a germ center

over some parts of the animal's body that were devoid of hair.

The colt continued to grow and take on flesh. At times the discharge from the eyes and nostrils was entirely absent. Occasionally a watery discharge containing flakes would be observed coming from the nostrils. The submaxillary glands remained nodulated and gradually increased in size.

In the spring of 1922 the colt was again allowed to graze with the other horses on the farm until early in June, when it

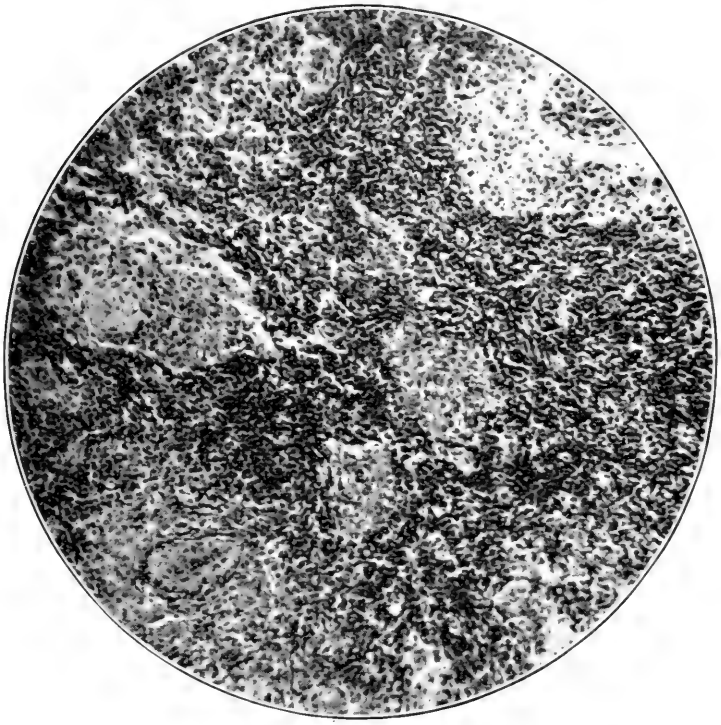

Fig. 3—Section of lymph gland, showing considerable new tissue, some of which consists of epithelioid cells

was observed that he had lost considerable flesh. It was then decided that there was no chance for an ultimate recovery, and the owner was advised to destroy the animal.

Postmortem findings.—Prominent gross lesions were found in the spleen, liver, visceral pleura and small intestine. The spleen was normal in size and color but showed on its parietal surface two light-colored rather firm fungoid masses. The surface of

the liver and the visceral pleura also showed fungoid masses. The small intestine showed a large, thick-walled, spherical dilatation. The lymph glands were slightly enlarged and paler in color than normal.

Histologic findings.—Sections of the spleen showed a marked round-cell infiltration of the capsule and trabeculæ, and numerous epithelioid cells in the splenic pulp and in some of the Malpighian corpuscles. The new tissue on the surface of the spleen (in the fungoid masses) was made up of round cells, fibroblasts, angioblasts, plasma cells and blood vessels.

Sections of the liver showed a round-cell and polynuclear leukocytic infiltration around the branches of the portal vein.

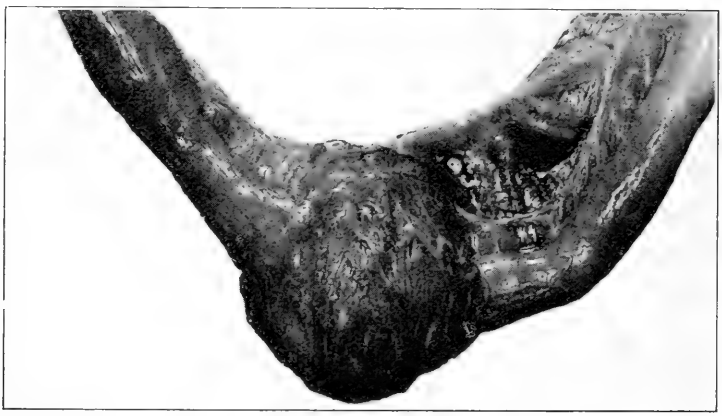

Fig. 4—Dilation in small intestine

The new tissue on the surface of the liver was granulomatous in type, like that on the surface of the spleen. In the liver itself, where the new tissue had replaced the liver cells, there were numerous bile ducts.

Sections of the lymph glands showed a marked round-cell infiltration of the capsules and trabeculæ, and, in some of the glands, a well-marked sinus catarrh. In the germ centers and in the medullary cords there were many masses of epithelioid cells. In some areas these epithelioid cells replaced practically all of the lymphoid tissue. In some of the glands a few giant cells of the Langhans type were found.

Sections of the dilation in the small intestine showed marked hypertrophy of the muscular coats, complete disappearance of the crypts and villi, and metaplasia of the epithelium into a thick layer of stratified squamous epithelium with approximate cornification at the surface.

Fig. 5—Liver, showing fungoid masses on the surface

There was not any necrosis found in any of the sections of tissue, nor were there any microorganisms observed in sections stained with hemotoxylin and eosin.

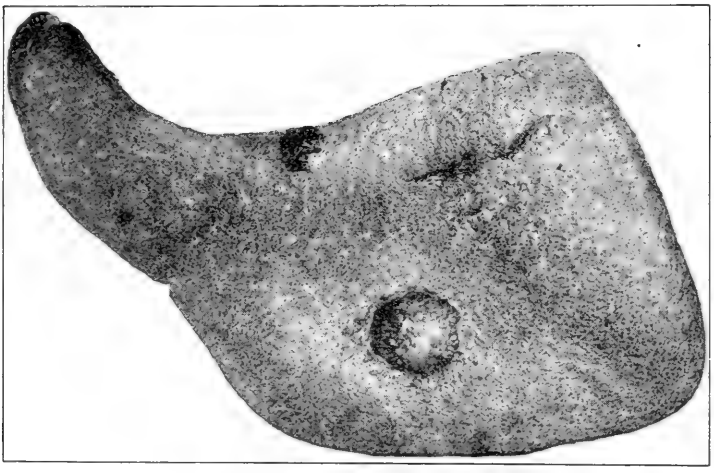

Fig. 6—Spleen, showing fungoid masses on the parietal surfaces

COCCIDIOSIS IN CATTLE IN MONTANA

By HADLEIGH MARSH

Montana Livestock Sanitary Board, Helena, Montana

WHILE COCCIDIOSIS in cattle has been reported several times in the United States and recently in Canada,[1] it does not appear to have been generally recognized as occurring to any great extent in this country. For that reason a report of its occurrence in a number of places in Montana should be of general interest.

Since the laboratory of the Montana Livestock Sanitary Board was opened in 1919, a positive laboratory diagnosis has been made in ten cases, widely distributed over the State. A number of reports of losses probably involving coccidiosis have been received in which no laboratory examination was made. Previous to 1919 bovine coccidiosis had been positively diagnosed only once in Montana, so far as we know. About 1915 Dr. Howard Welch, of the Montana State College, observed coccidiosis in two cattle in the college herd, and confirmed the diagnosis by microscopic examination. Dr. C. H. Schultz,[2] who has published two articles on coccidiosis, made a diagnosis of coccidiosis in sheep in western Montana. Between 1915 and 1919 several clinical diagnoses of bovine coccidiosis were made by Montana veterinarians.

The distribution of this disease in Montana seems to be quite general. When we first observed the condition we looked for some importation of feed or some other outside source, but it appears that the coccidia are pretty generally distributed, and that the disease may occur almost anywhere when the conditions are favorable. The ten cases in which we have made a positive laboratory diagnosis occurred in nine counties representing all sections of the State. During the winter of 1919 and 1920 a large number of reports came to this office of losses from bloody diarrhea, the majority of which were undoubtedly coccidiosis. These reports came from all parts of the State.

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[1] Bruce, E. A. Bovine coccidiosis in British Columbia, with a description of the parasite *Eimera canadensis*, sp. n. Jour. Amer. Vet. Med. Assoc., vol 11, no. 6, March, 1921, p. 638.

[2] Schultz, C. H. Coccidiosis in cattle and carabaos in the Philippine Islands and ts relation to rinderpest. Jour. Amer. Vet. Med. Assoc., vol. 1, no. 6, March, 1916, p. 687.

Schultz, C. H. Mysterious losses among cattle in the Pacific Northwest. Jour. Amer. Vet. Med. Assoc., vol. 6, no. 6, Sept., 1918, p. 711.

Coccidiosis, as observed in Montana, occurs principally in calves, about 6 months old, with some cases in yearlings and two-year-olds. Older cattle may occasionally be affected. This is in agreement with Bruce, who describes four outbreaks in Canada. In three of these cases the majority of the animals affected were calves, while the fourth outbreak occurred in a bunch of fifty, all over 1 year old. Those affected were yearlings, 2-year-olds and 3-year-olds. Smith and Graybill[3] reported in 1918 an outbreak of coccidiosis in calves under 3 months old. They observed only one case in this herd in an animal over 3 months old. We have not observed the disease in calves under 6 months old.

All but one of our cases have been in bunches of stock cattle on winter feed or pasture. The one exception was in a herd of purebred Shorthorns, in which a number of animals were affected, some of them being heifers which were kept in a barn, and others being run in a pasture. We have no report of its occurrence in dairy herds.

All the cases reported to this office have occurred in the winter, between November 15 and March 15. The cases reported by Bruce occurred in January, February and March. This is in contrast to the statement of Hutyra and Marek in regard to red dysentery as it occurs in Europe. They state that this disease occurs almost exclusively between the months of June and September, when the cattle are on mountain pasture.

In most of our cases the history shows that the cattle were being fed alfalfa hay. In one case the history was that the cattle were running on bad land pasture, but it may be that this was supplemented by hay feeding. It appears that in some way the occurrence of the disease is connected with the feeding of irrigated hay, as during the winter of 1920-21, which was an open winter with little feeding, we had practically no reports of this condition. On the other hand, numerous cases were reported during the winters of 1919-20 and 1921-22, which were severe winters, necessitating the feeding of a large amount of hay. We have a history in one case in which a large number of cattle were involved, that the losses stopped soon after changing from alfalfa to wild upland hay.

[3] Smith, T., and Graybill, H. W. Coccidiosis in young calves. Jour. of Expt. Med., vol. 28, no. 1, July, 1918, p. 89.

While we have not had opportunity to carry out experiments to prove this theory, it appears reasonable to suppose that the conditions of warmth and moisture in an irrigated hay field during the growing season are favorable to the development of the coccidial öocyst to the stage where it is infectious. As cattle do not have access to these fields during the summer months, the disease does not appear until the winter feeding season, when the cattle are turned into the haw meadows, or are fed hay which has been cut from these infected fields.

The diagnosis of coccidiosis should not be difficult in most cases. Where the stock affected is mostly calves, and the principal symptom is bloody diarrhea, with straining and prolapse of the rectum in some cases, and without a high temperature, one is warranted in making a clinical diagnosis of coccidiosis. This can be confirmed by microscopic examination of the feces or the mucosa of the rectum, in which the öocysts of the coccidium may be easily recognized. As specimens of feces do not always show the coccidium in any number, where a postmortem examination is made, a portion of the affected rectal wall should be taken for microscopic examination.

There are cases, however, where the diagnosis is somewhat difficult and there is a question as to whether the coccidiosis is the primary condition present. For instance, in one case a loss of 50 calves out of 400 was reported, and the history given was that some of these calves had "piles." When the condition was investigated, a hospital bunch of about 40 calves was found, none of which at that time showed a bloody diarrhea. Postmortem examination of two of the calves showed rumen impaction and some inflammation of the ileum and congestion of the rectal mucosa. These calves had been taken from the cows early, and were being fed a poor quality of alfalfa hay, with poor watering facilities, and the weather was very severe.

The clinical diagnosis was that the cause of the loss was the feeding conditions rather than any specific disease. However, laboratory examination of specimens from the rectums of the two calves on which postmortem examination was made showed öocysts of the coccidium present in small numbers. In view of the laboratory findings, it is possible that the final diagnosis should be coccidiosis, with the feeding condition considered as a predisposing factor.

The symptoms of coccidiosis as observed in our cases correspond closely to those described by Bruce. The characteristic feature of the symptoms is the bloody diarrhea. The feces become very thin and dark colored, and contain blood and mucus. There is violent straining and in many cases prolapse of the rectum. The appetite falls off and the cattle become stupid and show a staring coat. In the later stages some of the affected animals have so-called fits. They stagger and fall forward and go down. After a short time they may get up again and appear normal. This occurs at intervals, and after one of these fits the animal may lie until death occurs. There is no fever with this disease

The lesions found on postmortem examination are confined to the intestinal tract, and are most noticeable in the ileum and rectum. In some cases the only lesions found were in the rectum, and in one case everything appeared normal except about 12 inches of the lower end of the rectum. In another case the whole large intestine was intensely inflamed and hemorrhagic from the ileocecal valve to the anus. The mucosa of the rectum is thickened and corrugated, usually deep red in color, and covered with mucus. The colon may show congested areas and hemorrhagic spots. The ileum shows a catarrhal inflammation.

Without accurate information, I estimate the mortality at about 25 per cent of those affected. In those cases where death occurs the animal may die in a few days after symptoms are first noticed, or may become gradually weakened and live several weeks. As to the course of the disease in a herd, it seems to run from one to two months and possibly longer, but it appears to be self-limiting.

We have recommended treatment in several cases, but have not been able to check up the results very closely. The first recommendation has always been a change of feed. In nearly all cases the cattle had been fed alfalfa hay, and it has been advised to change to wild upland hay or to dry pasture. In some cases we have treated the affected animals by drenching with linseed oil, followed by treatment with sulphocarbolates.

In several cases we have recommended the treatment advised by Bruce, modifying the amounts to make the mixture as follows:

Sulphur	6 pounds
Iron sulphate	6 pounds
Salt	6 pounds
Linseed meal	82 pounds

This mixture is fed in troughs daily to 600 calves or 300 grown cattle. This treatment gave good results in one herd where we were able to get a complete history.

MOIST ECZEMA OR CANKER OF THE EAR OF THE DOG

By J. P. TURNER, *Washington, D. C.*

THE average practitioner usually has considerable trouble in treating this disease of the ear, especially if it has passed into the chronic stage. We judge this to be so, owing to the number of inquiries made by veterinarians in the various veterinary journals during the past year. The treatment herein recommended has been used for several years, both in the acute and chronic forms of canker and is usually followed by complete recovery. Success with this treatment varies according to the degree of thoroughness which which it is carried out, as we do not depend on the owner treating these cases by issuing him the medicine and instruction, as it is seldom that he will follow directions thoroughly, nor will he clean out the ears properly. We have cases at times that require half an hour of work to get the ears thoroughly clean for the first or second treatment.

It is believed that the stimulation caused by the silver nitrate solution and the dehydration of the ears by the alcohol are responsible for the success of this treatment. For a drying powder we have used bismuth formic iodid, as it is almost odorless, and is very light and easy to pack into the ear. Tannoform, zeroform, or other such powders may be just as useful, but we have not tried them.

1. When the ears are very painful, drop a small quantity of 4 per cent solution of novocain in each ear and carefully work it into the ear. Wait five minutes before proceeding further.

2. Swab out each ear thoroughly with hydrogen peroxid (pure) and clean away all discharge and scales, until the ears appear clean. This may require a half hour of work or more. Dry out with cotton on dressing forceps.

3. With small quantity of cotton and dressing forceps, cauterize the ears as deeply as possible with silver nitrate solution 15 gr. to 1 oz. Dry out thoroughly with cotton.

4. Pour small quantity of alcohol into each ear, in order to dehydrate the skin. Swab out with cotton until dry.

5. Pack ears as deeply as possible with bismuth formic iodid powder.

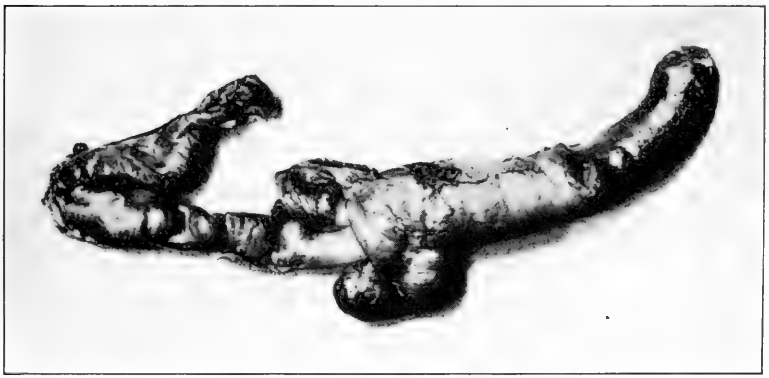
This treatment should be administered twice a week. The ears are to be packed daily with bismuth formic iodid powder.

INTUSSUSCEPTION OF INTESTINE OF DOG

By N. S. MAYO, *Chicago, Ill.*

DR. A. DEAN, of Chicago, Ill., brought to the Abbott Laboratories an interesting canine specimen with the following history:

The dog was a female black police dog, three months old. The present owner had paid a high price for this dog and had owned her for about a month. The dog on arrival was found to be in



Intussusception of intestine of dog

poor condition, although she had a ravenous appetite and was suffering from dysentery. There was no vomition.

The dog was treated for diarrhea and worms without results, and was brought to Dr. Dean's hospital on Thanksgiving Day, suffering from convulsions.

The first symptoms of the convulsions were champing of the jaws and profuse salivation. This would continue for two or three moments and was followed by a peculiar whining bark. The dog would make an effort to escape from her pen. Feces and urine would be evacuated involuntarily during an attack. The dog would then lie quietly for about twenty minutes, then she would suffer from another attack, unless she was kept under

the influence of a narcotic. The dog had partaken of no food or water for two days.

Dr. Dean recommended the destruction of the dog, and the owner consented.

An autopsy revealed an intussusception of the intestine, as shown by the accompanying cut.

This animal showed no evidences of abdominal pain. There was no vomition, and the fecal discharges were fluid.

PERVIOUS FORAMEN OVALE

By C. J. MARSHALL, *Philadelphia, Pa.*

GUERNSEY calf delivered with considerable traction. Showed well marked dyspnœa. Would nurse when assisted to stand. Was examined by the Ambulatory Clinic on the third day after delivery. Symptoms: Unable to arise without assistance; heart beat rapid and tumultuous. Respiration rapid and moaned with each expiration. Membranes cyanotic and extremities cold.

The case was diagnosed pervious foramen ovale and small doses of digitalis were prescribed. Case was seen one week later. Symptoms were practically the same. Death occurred one week later and autopsy confirmed the diagnosis. Yet at the farm we were unable to locate the opening between the two auricles on account of too much haste. The heart was brought to the department of anatomy where the opening was easily located.

The herdsman suspected that the symptoms might have been caused by an injury at the time of delivery. The autopsy findings showed nothing more than the congenital defect.—*From Veterinary Extension Quarterly, U. of P. Bulletin, vol. XXIII, no.* 16.

CAUSE AND EFFECT

A lack of teamwork between the news and advertising columns is shown by the following items which appeared in an Atchison, Kans., paper:

"Roup has broken out among Atchison chickens."

"Chicken dinner at Union Hotel tomorrow, 50 cents."

"The new lunch at the old Eglinger stand. Chicken dinner, 50 cents."

ABSTRACT

STUDIES ON VIRULENCE OF TUBERCLE BACILLI. Fernbach and Rullier. Rev. Tuberc., vol. 3 (1922), no. 2, p. 160. Abst. in Amer. Rev. of Tuberc., vol. 6 (1922), no 10, p. 272.

Fernbach and Rullier made two communications, giving additional evidence of results previously made known, namely, that although cultures of the Vallée bovine strain of the Pasteur Institute had their virulence only slightly diminished by digestion in an artificial gastric juice, being still capable in most cases of provoking a generalized tuberculosis or at least a lymph node tuberculosis accompanied by abdominal lesions, especially of liver and spleen, the bacilli of pulmonary tubercles taken from animals infected by cultures from the same stock lost their virulence by artificial gastric digestion to such an extent that an emulsion made from the tubercles never produced evidences of tuberculosis when injected into guinea pigs. Two new series of experiments were described. The first one, made with pulmonary tubercles, was devised especially to answer the objection that the number of bacilli might have been less in the tissue emulsions than in the material injected from laboratory cultures. From computation of the number of bacilli contained in the emulsion, it was estimated that not less than 1,800,000 germs were injected in the largest doses; that is, nearly 180,000 times enough to infect a guinea pig. The second series of experiments was made from tubercles taken from the spleen, which, having a lower resistance to the tubercle bacillus than the lungs, might perhaps harbor bacilli that would be affected differently by artificial gastric digestion. But in spleen tubercle emulsions also, three hours' digestion at 52 degrees to 53 degrees abolished the virulence of the bacilli. In both series of experiments all the controls developed tuberculosis within nine days. Among the animals injected with emulsions of lung tubercles, 60 per cent were alive and free from evidences of tuberculosis two hundred and fifty days after inoculation. A vigorous search demonstrated no signs of tuberculosis in the 40 per cent that have died. In the series injected with spleen tubercles no signs of tuberculosis were present at the end of nine weeks. Local lesions were absent in most

cases; the exceptions which occurred were explainable as due to irritation caused by injection of such large masses of substance or to accidental contamination; they never resembled tuberculous lesions. Artificial digestion, therefore, annihilates the virulence of tubercle bacilli more completely than death by heating, since injection of bacteria killed by heat produces suppuration any many even cause the formation of nonbacillary tubercles.

REVIEW

VETERINARY BACTERIOLOGY. A Treatise on the Bacteria, Yeasts, Molds and Protozoa Pathogenic for Domestic Animals. Robert E. Buchanan, Ph. D., Professor of Bacteriology, and Charles Murray, B. Sc., D. V. M., Associate Professor of Veterinary Bacteriology, Iowa State College of Agriculture and Mechanic Arts. Third Edition. Thoroughly Revised. Octavo of 604 pages, with 209 illustrations. Published by W. B. Saunders Company, Philadelphia and London, 1922. Price $4.75, cloth.

This is the third edition of Veterinary Bacteriology by Buchanan and Murray, the second edition having appeared in 1916. Its scope is clearly set forth in the subtitle as covering the Bacteria, Yeasts, Molds and Protozoa pathogenic for domestic animals. The contents is divided into 7 sections composed of 47 chapters. The revision has been necessitated, as stated in the authors' preface "by the advances in this field in the last several years."

The outstanding features of this volume are the use of the newer classification of microorganisms and the adoption of the more recently recognized nomenclature. These revisions are quite timely and will be welcomed by the workers in veterinary bacteriology.

The authors have revised all the subject matter pertaining to the reaction of culture media and the production of acid by microorganisms to read in terms of hydrogen ion concentration rather than the indefinite expression of acidity or alkalinity measured in terms of the amount of normal acid or alkali present per hundred c.c. of solution.

Advantage has been taken of the opportunity to eliminate dis-

cussions of organisms whose etiological relationship is questionable; also those that were at one time thought to be separate and distinct species, but which in the light of more recent investigations have been shown to be representatives of well-known species occurring in somewhat different pathological conditions. The authors have seen fit to omit the discussions on *Bacillus lactimorbi* and *Streptococcus abortus*.

The chapter dealing with the spore-bearing anaerobes has been carefully revised in order to keep pace with the remarkable strides recently made in the studies with this very important group of organisms.

The authors have apparently overlooked the present status of dourine in this revision. The distribution of this disease in the United States is quite different from that given in this volume. The subject of cultivation of the *Trypanosoma equiperdum* would be more completely presented if the works of Mohler (Proceedings of the A. V. M. A., 1905, p. 363, and B. A. I. Bulletin 142) were included, since this investigator cultivated this trypanosome years before Thomas and Breinl and with much more success.

It, moreover, appears that an up-to-date discussion of this disease might advantageously include the published data on the hundreds of thousands of blood samples tested for the presence of dourine in the United States.

A careful comparison of this edition with the previous one will reveal the great number of changes that were necessitated by a radical revision of classification and nomenclature. The revised edition has much to commend itself to all concerned with diseases of domestic animals. This book should by all means be found in every veterinarian's library. It will also serve a very useful purpose as a reference text to the bacteriological and medical fraternities at large. W. S. G.

IN KENTUCKY

The Major—Over there is the colonel; a fine judge of horseflesh.

City Visitor—So am I; I've dined in restaurants for the last twenty years.—*Washington Star*.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the January* JOURNAL)

LARGE-ANIMAL CLINIC

WEDNESDAY MORNING, AUGUST 30, 1922

(Continued)

CHAIRMAN KINGMAN: Dr. DeVine will use the rest of the time. We are very pleased to have him with us.

BOVINE STERILITY DEMONSTRATION—DEVINE

DR. J. F. DEVINE: Gentlemen, you all realize it is not possible for Dr. Boyd and myself to make specialists of you here in a couple of hours. Dr. Boyd has covered this thing about as well as a man could cover it in one lecture. After you get the fundamental principles of the thing, the next thing you ought to do is to come and spend a week with me, and I will make real men of you. The only thing I will ask is that you don't all come at one time. There are always two or three men there. You are welcome to come and stay with me as long as you like, but I can't handle more than two or three at a time. I can give you more information in a week in the field than all of us could give you here in months. But there are certain things that any of you who intend to take up this work, or even who are doing general practice, ought to understand, and that is what Dr. Boyd and Dr. Bemis have been trying to tell you this morning. I don't see that there is anything left for me to add, unless I tell you about the way I go at my cases in actual practice.

There are certain fundamental principles that you must keep in mind if you are going to get in this work and not get in trouble. One is to know how to examine an animal without injuring her, and the other is to make sure that you can diagnose pregnancy and not abort them, because if you do abort them your name as an expert in that community is done. I don't know of anything that is more disappointing or embarrassing to the veterinarian than to be called to see an animal that is giving the owner trouble and then in two or three days after he leaves have the animal abort.

You must never pay much attention to the history that the owner or herdsman may give you. I don't care what his records are or what his conditions are, or how accurate they are. I went away down to South Carolina last fall to examine a white-face, an imported cow, that had calved six months before, and she had not been in heat since that time. The owner was becoming very much concerned about her, as he paid $4,000 for her. I went down and found a nice five months' calf in her, perfectly alive and all right, and the veterinarian who was in consultation with me will tell you that she calved all right in due time. Now they were positive she had never been in heat; she evidently had been. That is only one occurrence; it is a thing that you meet every day in every herd. Therefore, these organs that are here for you to examine are of tremendous advantage to you.

Dr. Boyd explained to you that the way to learn this work is to go into an abattoir and get familiar with the organs, and that is absolutely right; get familiar with the different sized organs as they advance in pregnancy. He also explained to you that it was very necessary to have a lot of experience, and that is absolutely so. A man, if he is adept at it at all, can become so proficient in the work that up to about three months he can tell within three or four days how long the animal has been bred; in other words, you can tell a six weeks' pregnant animal or you can tell a six and a half weeks' pregnant animal. You must, of course, take into account the size of the cow, the size of the uterus, the age of the animal, and oftentimes the breed. The beef breed animals have a longer and more flabby uterus than the little Guernsey or Jersey. All those things are to be taken into account, but experience will make you expert at it.

In examining animals I prefer never to use an instrument, excepting possibly that I shall now learn how to use the glass speculum. I mean to say that forceps are in the way and are absolutely unnecessary for your original examination of most animals. You can manipulate the uterus much better in its normal position, and it helps you locate the different parts of the genital organs so much more readily. It is absolutely necessary, in my judgment, to keep the forceps off the uterus if you wish to palpate the Fallopian tubes in their normal position, and you can if you let the uterus hang as it should.

You must always be able to differentiate pregnancy from other conditions. It is a very important thing.

There doesn't seem to have been much said relative to the arteries that supply the uterus with blood. Without the examination or without the knowledge of the posterovaginal artery, its size and its beat, I would be nonplussed many a time. Only

last Saturday before I left home I had got in touch with a veterinarian over the telephone about a herd that he helps me with, and we have had in that herd four cases of mummified fetuses within the past three years. Each time I went down and pressed out the corpus luteum in the corresponding horn, that is, the corpus luteum of pregnancy. I told him that in about 48 hours the cervix should dilate, and to watch the animal and take the fetus out and never risk its coming out itself. It is dry, as you know, when it is mummified, and sometimes it gets stuck on its way out. Each time he has taken the fetus out. He telephoned me the other day that he had a cow that was due to calve the last of May; she is three months overdue. He said he could not just make out what it was. He did not think there was mummification there, and he had pressed out the corpus luteum and the cervix had not dilated as in other cases; so I told him to have the cow shipped up to my hospital. When I got back from northern New York I had but a few minutes to get ready to come up here and I made an examination. I could not tell what I had. It was not mummification, that is certain, because when there is mummification the specific gravity becomes so much less than the abdominal organs that the uterus floats up pretty near in its normal condition and can readily be handled. It hasn't weight enough to be down deep. In this case it lay down deep enough to be a six months' pregnancy. I couldn't handle the fetus, but still I could handle the fluid in the uterus. It was not pus; the uterus hasn't taken on the thickened feel and the slow, fluctuating fluid that you get in pus. If it had gone on to maceration and pus formation it would soon be lighter and float up where I could reach it, but now it is down in the bottom of the abdomen; still there is not a live fetus there. How do I know that? Because the artery has no more pulsation than if the animal was not pregnant at all; and I defy any man to make a diagnosis of that case, whether there is a live fetus there or not, unless he is familiar with the artery.

I reached in and finally located, with much effort, the ovary, and I found that the doctor had evidently been mistaken. If he had pressed on the corpus luteum, he had imperfectly pressed it out and there had been regeneration of it, because there was a full, deeply located corpus luteum on that ovary. I pressed it out, and I expect that my associate knows whatever was in that uterus by this time.

When you go into a herd to make a regular examination, always see that the animals are fasted at least 12 hours, and it is better still to keep a bulky feed away from them for at least 24 hours if you can. That has an advantage if you have to maul them about a good bit, and if there are adhesions, you must. When there is a considerable amount of abortion in a

herd, the secondary invaders get in and cause metritis, and if the cow has a little pain and lies down and strains and there is metritis, all of you men who have had any experience with surgery know the minute she shoves back the colon against the uterus you can get adhesions in about half an hour. In other words, if you can break them loose and she lies down, they will grow fast in about half an hour; so you want an empty bowel if you are going to break any adhesions loose; and if there are many adhesions you are going to make the cow a little sick at the best. If she is empty, you avoid all this digestive trouble that would come on after the manipulation. I question whether there is any man that will go into a herd and examine ten or twelve cows accurately and correctly if the cows are full of grass or green silage or corn or alfalfa. The bowels keep rolling on your hands so rapidly that it tires your fingers and keeps pushing your hand out of the area after you have located the little tubes. So I say from a practical standpoint always have the animals fasted.

My method is, then, after you get the cow cleaned up fairly well, to dilate the rectum just enough to let air in. Just put your fingers in and dilate it, and if she is fairly fasted, you won't be troubled during your operation, if it is just an ordinary examination.

Then I like to examine the vagina; see that it is normal; see that the cervix is nice and tight, as Dr. Boyd described to you. Remember there are very few cervices that ever need opening; there are a lot that need closing. Of course keep in mind what he has told you relative to the mucus drying up and the formation of a seal beginning. That will telegraph to you that there is a possibility of pregnancy, irrespective of what the history may be. I like to locate the cervix and then get a hold of it any way I can, just enough to steady it, and then reach in to the bifurcation. Remember that Dr. Boyd told you that you must not try to reach the liver; you don't have to; just go in a little way. Steady the cervix so that when you begin to look for the uterus you are not pushing it out of the way. Then you reach over that bifurcation with your fingers, and you get a sort of a feeling like a grip on it. Don't grab into it, because you may have one of these six weeks' or seven weeks' pregnancies, and if you grab in there you will crush that little embryo and kill it and abortion takes place. Just get under it and throw it right back in the pelvic cavity, if it isn't already there. You are not in any farther than your wrist. Then I take the right horn, for instance, in my left hand, and go around until I find the ovary. All the time I am making a mental note of what is going on. If the cow has had two or three calves, the horn she has been pregnant in is larger than the other. Make all those notes in

your mind, and then reach around and come back a bit, and here is the ovary just inside of the pelvis, so to speak. Make a careful examination of the ovary. After you get it in your hand, just suspend it there and come back and locate the tubes, and follow them right along back to the end of the horn. Remember that a tube that is enlarged at all is a dangerous tube; it is naturally very, very small and hard. Come along back and then go right on to the other side. (I always use one hand for both ovaries.) Then you follow the other horn around and just keep that cervix stiff enough to steady it, that is all. So make the examination first, and always with the idea that this cow may be pregnant. Never get that out of your mind until you are thoroughly satisfied she isn't.

There are a thousand things that may confuse a beginner, but you can't learn them all in a day. Twenty years ago when I began trying to know something about this thing, it took me five years to learn what you can learn here this morning. There is no literature on it, nothing to tell you how to do a thing or what you might find or what you might not find.

There are some cows here, I understand, that are actually diseased cows, and I will examine them and attempt to tell you what I find. You men who have had experience will be interested in handling them. The man who hasn't done any of this work can't tell a thing about it.

CHAIRMAN KINGMAN: Are there any questions that you want to ask Dr. DeVine?

QUESTION: What do you think of vitamineral?

DR. DEVINE: I think it is the best thing of its kind made, but I don't think it cures contagious abortion. If there is a mineral deficiency and you are having trouble that an intelligent practitioner can couple up with defective calves or immature calves, I would recommend vitamineral in preference to anything I know of of that sort; but so far as curing abortion, I have no faith in it. I have absolutely no faith in straight bacterins. I used them repeatedly for years under conditions under which I had a chance to make rather definite observations, but since I have been having my own laboratories and have been able to produce some bacterins of a definite strain for certain herds, the straight bacterins have never given me any results.

QUESTION: About what per cent of sterility is due to retained corpus luteum?

DR. DEVINE: I think it is associated with other troubles. There is a cystic ovary usually when there is a cystic corpus luteum; there is a diseased ovary or probably there wouldn't be a diseased corpus luteum. So far as producing a lot of sterility, I question if it does.

QUESTION: What about the live culture?

DR. DEVINE: I have absolute faith in the live culture, because of what Dr. Schroeder, who is the ablest worker of his kind in America, has proven, and because I have proven to my own satisfaction in herds that it has helped to reduce abortion almost to a minimum.

QUESTION: About what have you found as the safest length of time, or rather the time from the administration of live culture until the animal may be bred?

DR. DEVINE: I am basing my conclusions entirely upon the experimental work done by the German Royal Commission and by Dr. McFadyean and by Dr. Schroeder, and they estimate it takes about two months to produce immunity, and you should not breed under that time. Any time after that is all right.

QUESTION: How long will the immunity last?

DR. DEVINE: McFadyean says the British Royal Commission say it will last several years, possibly the life of a cow; but there is no good reason to make that statement, because they haven't done enough experimental work or carried it on long enough to take in the life of any cow.

QUESTION: How many injections of the live culture are necessary?

DR. DEVINE: One injection. In my own herds, when there is actual disease in the herd, I recommend that every animal be put on live culture, and that we repeat the live culture at least another year, knowing that the law of immunology isn't always perfect or a hundred per cent.

QUESTION: How much of the live culture do you use?

DR. DEVINE: Whatever our bacteriologists make. I couldn't count up as they do. We use 20 c.c. of this heavy suspension, and I forget how many billions in it.

CHAIRMAN KINGMAN: Would you discuss cervicitis a little bit, Dr. DeVine?

DR. DEVINE: Cervicitis, as has been told you this morning, is no doubt due to the secondary invaders. The cervix is a mean organ to treat. We dread necrotic cervicitis because we never know when it is going to end. You can't make the same diagnosis that you can if you press out a corpus luteum and know that has been the occasion of holding up estrum. You can tell the owner, "This animal is perfectly normal now. She just had something in one of the ovaries that we took out. She will go in heat in a few days. Keep her cervix clean and her vagina and she will probably breed the first time you serve her." But with cervicitis, some may respond immediately, and some never. I had sixteen cases shipped to my hospital at one time last fall, and this had been running from two to four years; they had had various kinds of treatment. The mixed metritis bacterins took care of those. The other cases we kept burning with dif-

ferent kinds of caustics until I finally got up to 40 per cent nitrate of silver. I believe now if I had a lot more of the same type and burned them well, starting with 40 per cent of nitrate of silver, and then douched them every day or every second day with very hot water, and added something like bicarbonate of soda or sodium chlorid, it would be quicker. I took 40 per cent solution of nitrate of silver and took a long stick and put a big, heavy swab of cotton on it and went in there and swabbed and swabbed and swabbed.

CHAIRMAN KINGMAN: Is it your intention to go the full length of the cervix?

DR. DEVINE: If it needs it.

CHAIRMANN KINGMAN: Are you practicing any surgery on the cervix?

DR. DEVINE: No, sir, I am not. I saw young Dr. Williams take off the cervix beautifully, but I confess I don't think I could ever learn to do it. It is a real job. I don't know yet that he has published any statistics as to how satisfactory it would be in practice. Have you, Dr. Way?

DR. WAY: I have never seen any report of his work along that line.

CHAIRMAN KINGMAN: Are you performing ovariotomy on one side?

DR. DEVINE: No, I haven't. Perhaps you might be justified. If there were salpingitis that I thought was seeping down and keeping the uterus infected, and the diseased ovary, I see no reason why the ovary should not be taken out; but if there is simply a diseased ovary that isn't infecting the tube, I am not concerned about it. I don't see what the advantage would be.

QUESTION: Have you had any trouble with vaginitis?

DR. DEVINE: We do have vaginitis, but they all respond so easily to treatment that we haven't any cases that have given us any great concern. I went into a herd once where there were several cases, and every time the bull served the cow that meant a case of vaginitis, but they were all cleared up in two weeks. Here is the treatment we used: We made up a powder we call our dusting powder; it is nothing more than sterilized salt dried, and douched them every day with that.

QUESTION: Give us a treatment to restore to normalcy a cow that has been in high milking flow and high protein contents and failed to conceive.

DR. DEVINE: Give her plenty of exercise; feed her lightly; let her get somewhat thin, then correct anything that is wrong. Very, very fat cows will give you trouble.

QUESTION: How do you proceed to drain a case of pyometra?

DR. DEVINE: Dr. Boyd covered that pretty thoroughly, I thought. Let me take a concrete case. We went down to Ken-

tucky a year ago to see a cow that they had bought in New York for $6,500. She was due to calve in July and they bought her in June. She hadn't calved, and this was the next March—last March. She had been pronounced with a calf eight months before she left. The probabilities are that she had her uterus full of pus then, and she carried it seven, eight or nine months, and may be longer. When I reached in there I found that this was a great big uterus, large enough probably for a five months' calf. Both horns were filled; in other words, the same as if there were a five months and a half twin pregnancy. But of course the fact that the artery wasn't beating, and that the uterus laid up there right back of the rumen where it could be handled made it plain that there was not a five months and a half fetus. In other words, the size of the uterus was altogether out of proportion to its weight. The five and a half months' uterus with twins would be out of reach entirely. That cervix was partly dilated. I simply passed a semi-hard rubber tube in and the pus began to run. After it had run a while I said to the herdsman, "Wouldn't it be just as well to catch this?" So we caught a great big pail full, and we estimated there was about twenty quarts. We had fourteen quarts besides what had run out on the ground. It was thin pus. If it had been thick we might have had to pump something in first; but it was thin and ran just as fine as could be, and it drained right down almost to the last drop, because I put my hand in the rectum and kept pushing the uterus down, and it floated right up where it should be. I then put in two quarts of normal salt solution and rinsed it. The minute I did it, it dropped down. Now if I had put anything in there in the way of Lugol's, or anything to irritate that uterus and weight it down and didn't drain it, I would have established adhesions when that cow lay down and probably ruined the chances of her recovery. Don't do anything to excite an inflammation.

I went down on Sunday and massaged it, and there was about a quart in it. I went out to the farm again on the following Tuesday and massaged it, and there was some catarrhal mucus in it. I could not arrange with the local veterinarian to attend to the case, so we had to let her go.

I was down in Kentucky not long ago and talked to the superintendent of the farm, and he told me the cow is safe with calf.

QUESTION: Was there a continuous discharge from that cow before that?

DR. DEVINE: They said there had not been. I had a lot of correspondence about the case. Of course all I had for it was his word. There was no discharge behind her the day I examined her. That wouldn't mean there was never any dis-

charge, necessarily; it would probably collect in the vagina and drop out and not be noticed; but there was not a continuous discharge from this cow, notwithstanding the fact that she had about twenty quarts of pus in her uterus.

QUESTION: In the case where there is a dead fetus in the uterus and the cervix contracted so it is impossible to get in, what is the procedure?

DR. DEVINE: Of course, if there is a corpus luteum, squeeze it out; that would help dilation. You can't dilate the cervix of a cow very much.

QUESTION: Could you use the knife on the cervix in any way?

DR. DEVINE: Yes, you could if you couldn't get it any other way. I remember one we did cut in two places sufficient to get the hand in. I would rather not make any fresh wounds if I can help it.

CHAIRMAN KINGMAN: While Dr. DeVine is making preparation to examine the sterile cow, Dr. Bemis will show you what he has to demonstrate.

CHAIRMAN KINGMAN: Dr. Luckey, will you give us the history of this Jersey cow?

DR. LUCKEY: She is very high bred; brought a calf three years ago, and has been frequently bred since without any results. In heat regularly with very rare exceptions. She is somewhat aged, nine years old probably, and hasn't bred for the last three years.

(Demonstrations by Dr. DeVine and Dr. Bemis.)

CHAIRMAN KINGMAN: Dr. Devine has some further remarks.

DR. DEVINE: This cow is probably nine or ten years old. She had calves regularly up to three years ago and then she refused to have any more. I believe the local veterinarian has examined her, but we can't locate him just now to see what he has found. We haven't been able to find out whether she has been served by different bulls or not, but she probably has been. Her bulb is a little thick here. She evidently hasn't suffered much from cystic ovaries because she is full here. So with that history I will see what I can find.

I don't use anything but white soap, and it is well to keep your arms soaped all the way up, so that as you are manipulating you can move your arms at any time you wish. Never use any caustic soaps, because they are hard to work with and they are irritating.

Make your examination in the vagina first. I find here her cervix is slightly dilated, but the cervix is not wide open and weeping. If you had a wide open, weeping cervix, there would be handfuls of mucus in there. There is very little mucus; you can see here how much. You would expect that much mucus with that sort of a cervix. It is apparently clear and it doesn't

show any evidence of infection or even much catarrh. That is almost clear enough to be the mucus of estrum.

These little varicosities are almost like growth in the bottom of this vagina; you need not pay any attention to those; they don't have anything to do with irregular breeding.

Now I have located the cervix; I will steady the uterus and go in with my other hand. She hasn't been fasted, so she doesn't empty as well as she would, but she is not bad at all. If the bowel is full it keeps rolling on your fingers, and it is hard for you and tires your hand. As soon as your hand begins to get numb you lose the fine touch that is necessary.

This cow is pretty well along in years, and as you remember, Dr. Boyd told you that with the older cow the uterus would lie more ahead. I have hold of it, and I will draw it right back here so my hands are not in any more than wrist deep. I manipulate the cervix to see whether or not it is flexible and soft all the way back. If it is flexible and soft and has the proper touch, I don't have any concern about it being diseased in any way. Never think of correcting this trouble by dilating the cervix.

I have the uterus right back in my hand; I have the cervix pushed ahead just a bit, and there it lies right in my hand, tipped over; and I have the uterus in my upper hand. Now I will follow the right horn around; I have the right ovary in my left hand now. I will manipulate that ovary through the fingers of both hands. I find the right ovary is about the right size.

Now I will examine the tube to see whether or not it is enlarged. I usually trace the tube from the ovary back; it seems a simple way to do it. The tube is more easily handled in the living cow than it is on the table, because it hangs just so you can follow it. You should handle the tube all the way over, because there may be salpingitis in just one spot, so you can't make a hurried examination of the tube and make a thorough one. This cow handles very well because she is not full. I can just feel the tube; it is a little bit of a hard, wiry tube, which indicates in itself that it is all right. It is about as large as a horse hair. The right ovary hasn't any corpus luteum on it, and it is pretty smooth. It would lead you to believe that possibly it hasn't ovulated very regularly, or lately, at least. It seems to have about the right consistency.

Now I will follow the left horn right around. The left ovary in this case is lying pretty well down. This cow will breed. The left ovary indicates it might be going into sterility a little bit, but then it is very common to find that the ovaries are not symmetrical, not the same size. The left ovary has a soft spot in it.

My judgment is that if this cow's right ovary were massaged

regularly every five or six days, she would breed. Her left tube is probably twice as large as it ought to be. Now she is ovulating from the left ovary, and the left tube is suffering from an inflation, which always suggests atresia when it is at all enlarged. The chances are you can get her right ovary functioning, because the tone is good.

The treatment would be, then, to massage the right ovary and rub the uterus between the hands about every five days until ovulation begins; then leave that ovary alone and see that she comes in heat with the right ovary. When she comes in heat with the right ovary, you will find a corpus luteum in that ovary, and if she has a corpus luteum in there, then breed her. We always dust these cases four or five days before breeding, so if there is any catarrhal condition that would interfere with the semen it would be taken care of.

(The meeting adjourned at 11.50 a. m.)

WEDNESDAY AFTERNOON, AUGUST 30, 1922

POULTRY CLINIC

The meeting convened at 1 o'clock, Dr. Kingman presiding.

CHAIRMAN KINGMAN: It is my pleasure to introduce a man of international reputation, Dr. B. F. Kaupp, of Raleigh, N. C. He is responsible for this poultry clinic, and we will turn it entirely over to him until the end of the period.

POULTRY DISEASES—KAUPP

We have endeavored (I say *we* because I have enlisted the help of others) to give you a clinic which we hoped would be worth while. As to whether we have succeeded remains for you to determine. We have made an effort to produce some diseases here, you might say, to order, and that is a very difficult thing to do, as you know, because in acute diseases after the onset of the prominent symptoms it isn't very long until the bird is dead. However, we have some things which we hope will interest you.

I will take a few minutes with these specimens on the platter, while they are fresh. We will pass them around.

First is the problem of roup. I haven't the time to go into the discussion of roup and of accumulations of materials as a result of catarrhal conditions in the infraorbital sinues, or the sinues below or in front of the eye, but in connection with cases showing evidence of diarrhea and tuberculosis we also run across another specimen in which there is quite an accumulation of a cheesy pus in the lower part below and in front of the eye. That is a condition that you quite frequently find and is one which is readily treated. All you need is a sharp scalpel; rip the skin open over the part and remove the cheesy pus.

Usually to swab those parts out with pure iodin will give the best results. Pus in a chicken is always, or practically always, of a cheesy nature. We don't get a thin, liquid pus; and so in our surgical work with chickens we are not so particular about drainage as with livestock.

Dr. Schwarze has been kind enough to collect for us some chickens from an outbreak of tuberculosis. You know that we have certain isolated zones in our country in which tuberculosis is quite common. It has been our experience in our poultry disease studies that some sections are practically free, but in some sections we have quite a little.

The symptoms are rather vague, the bird gradually losing weight, gradually becoming emaciated. There may not be a partial loss of appetite. Laying hens that are attacked will, after a while, cease to lay. The comb will dry down, be small and dark and covered with a thin scale, indicating a general nonlaying condition of the hen.

In diagnosis you have two positive ways. One is, of course, resorting to postmortem, and the other is the giving of tuberculin. Dr. Schwarze was kind enough to inoculate these birds yesterday morning with the intradermal test. We haven't a good reaction to give you, but we can show it to you in the process of reaction. We should have seventy-two hours instead of thirty-six, as we have. This bird is quite poor, quite emaciated. The fat has disappeared from the breast region, and the muscles are somewhat shrunken. She has somewhat of an unthrifty appearance, and those of you who are familiar with the bird know that that hen is not laying because she hasn't the flushed red comb of the laying hen. In this side there was placed in the skin about one drop of bovine tuberculin. That is a very delicate operation in a chicken because the skin is so thin. Of course the avian tuberculin would be better, but we didn't have it, and we are getting a slight reaction with the bovine tuberculin. In reading the reactions, we have to use the same care that we do with cattle. A false reaction, due to infection, would mean, of course, a hot, circumscribed swelling, and in seventy-two hours this should be quite large.

The second method is that of postmortem. The lesions as they appear postmortem are in some respects similar to those of livestock. The tubercles are usually small, but they do not show that quick tendency toward calcification, and as a result those of you who have had experience in cattle and hogs should not expect the tuberculous lesions to cut gritty; and if they do not cut gritty don't say it isn't tuberculosis, because it may be.

We have a specimen from this same flock in which there is the miliary type of tubercle shown in both the liver and the spleen. Some of them in the spleen, which lies above the liver, are quite

large. These tubercles will not only be found in the liver and the spleen, but at times they are found covering over the surface of the intestines.

In this bird likewise, as you can see from the breast muscles and the retroperitoneal structure, the fat has all disappeared. Remember that the storehouse for fat in the chicken is the retroperitoneal location. In a fatter hen you will find in the abdominal wall perhaps nearly a half inch of fat, pure fat.

The next problem is one of *Bacterium pullorum* infection. *Bacterium pullorum,* as you know, is the cause of bacillary white diarrhea. It is transmitted from the hen through the ovum, which is infected, and the chick can go down with the disease in two or three days after it is hatched, and the bulk of the deaths come in the next few days. The diarrhea which occurs from the tenth to the fourteenth day we regard, as a rule, as not being due to *Bacterium pullorum,* but rather due to other causes such as chilling. Fifteen minutes out from under the hover in a cold atmosphere is sufficient to chill birds, and in a very few days the diarrhea and death begin.

Spoiled feeds and many other conditions, including environmental conditions, are some of the causes of diarrhea, which must be differentiated from white diarrhea. I don't think it is necessary for me to go into details on the symptoms, as I think you are all familiar with them, but more the diagnostic phases and how to get a flock that is free from white diarrhea.

At present some work is being done in regard to the perfection of a product from *Bacterium pullorum* similar to that of the tubercle bacillus. Possibly before long we shall be able, with the intradermal method, to test our hens. We are working now on the investigation of bacillary white diarrhea, making a study of the antibody formation. We find that the Widal test in our hands has been very successful in weeding out the chronic carrier.

There are two things to do in regard to getting rid of bacillary white diarrhea. First, get the reactors and get rid of those from the breeding flocks. Second, take those pullets and cockerels that have escaped bacillary white diarrhea in the first few days of their lives, and put them in a flock by themselves on new ground and in a new house. In that way you will get a bunch of pullets which are probably free from bacillary white diarrhea infection.

Now as to the ova in the affected hen. You will find a great many ova that are blighted; the yolk, as you know, is developed in the ova, then that routes itself through the capsule, separating or breaking, and the yolk passes into the funnel portion of the oviduct; then passing down the oviduct the albumen is formed around it in the second portion of the oviduct; in the third

portion two shell membranes; in the fourth portion or uterus, the shell; and then the fifth portion there is formed the tint, if the egg is tinted.

This hen shows quite a few ova that are blighted, and they are lying out in plain view. There is one lying on top which has shrunken considerably, is in a state of degeneration and has quite a neck hanging to it. This hen was laying, and there were two ova that would have been discharged in a very few days; but in order to show the diseased ova I took those away. Perhaps I should have left them for comparison's sake, but I accidentally ran my knife into one, and I got disgusted with it and pulled the other one off.

In order to connect this subject with another condition which must be differentiated from it, I am going to ask Dr. Graham to speak just a moment on *Bacillus botulinus* infection and the method of combating it with the antibotulinus serum.

BOTULISM IN CHICKENS—GRAHAM

DR. GRAHAM: We thought that the best way to present the subject of botulism in chickens would be by reproducing the condition in a few chickens and leave as control a few birds that had received some antitoxin to show the prophylactic value of the antitoxin as against this specific toxin.

The three birds that we used received yesterday noon one-half cubic centimeter of toxin, and the bird that is alive received the same dose of toxin with 2 c.c. of antitoxin. It is very difficult to put on these experiments and have typical symptoms of limberneck showing at the right time. We used some of the same antitoxin as a little test, and in twenty-four hours without antitoxin we had the characteristic symptoms of limberneck, the bird's neck falling, the bill just reaching the ground—a condition that some of you have seen in the field. The dose must have been too big or the toxin too hot, because we can't show you the field condition. If you saw the characteristic limberneck conditions I don't believe you would ever forget them.

The fact that limberneck in chickens is due to a specific toxin was first suggested, I believe, in California, by Dr. Hart, and he made a report on one outbreak in California. Pictures of it appeared in the A. V. M. A. JOURNAL about two years ago. The losses from this case, I believe, were 700 or 800 birds out of 1,500 within a week or ten days. The source of infection in this case was traced to canned beans, or possibly canned corn, that had been thrown into the garbage, and the birds had had access to it.

In the field infections that we have encountered, near Kansas City, we have been able in nearly all cases to find a source of contamination from the garbage, spoiled fruit or canned goods

that have been thrown near, and feel that that was the source. In some cases we have been able to get the specific toxin right from the garbage and reproduce the condition. Last fall we had quite an experience with it in the vicinity of Kansas City. The practitioner sent in quite a few birds, and it was felt that it was due to feeding wheat, because that was the only change of food the birds had received.

In diagnosing limberneck, we are not familiar with any condition that will produce the characteristic symptoms where the head falls right straight down between the legs, and whether other conditions or other infections will produce that, I don't know. I expect Dr. Kaupp will have something to say on other diseases that will produce limberneck, but in the field we have never found it, and with parasites, macerating them or feeding them, we have never been able to reproduce the symptoms of limberneck.

I might say just a word about the organism that causes it, *Bacillus botulinus*. Type A is the only organism that produces toxin that is fatal to chickens. There is another type of this same organism, Type B. We can feed large amounts of toxin to the chickens, and apparently no ill results. It is reported now through recent research work that there is still another type of organism which we have arbitrarily designated as Type C. That will produce similar conditions in chickens; so that we have a great deal to learn about botulism in chickens. We feel we are making a great deal of headway in studying the subject of botulism by the few facts that we have gained from animal experimentation and field studies.

I am sorry the birds are not showing that characteristic limberneck, because that is really the best part of a demonstration or information on botulism.

DR. KAUPP: The control which you see here, as the Doctor says, received 1 c.c. of toxin and 2 c.c. of antitoxin at about 11 o'clock yesterday. Of the two that are dead one was still warm this morning. The one that received ½ c.c. and the one that received 1 c.c. died some time during the night. These chickens are a little down in figure and perhaps the toxin worked a little fast in them. They had been used in experimental work for some other things, and that might be one of the causes.

We are particularly fortunate in having the cooperation of another research laboratory in helping us put on our poultry clinic. Mr. Wilkins and Mr. Plasantz of the research laboratory, Purina Mills, are doing quite a lot of work along nutritional lines, testing out the various feeds for possible deficiency in some of the various essential elements. We will now hear from Mr. Plasantz on the subject of deficiency diseases in pigeons and chickens.

VITAMINS IN POULTRY FEED—PLASANTZ

MR. PLASANTZ: Mr. Wilkins had originally agreed to present this subject, and I am going to try to present it in the best way I can.

The subject of vitamins is a rather new matter, as you know. It is only within the last ten years that there has been much concentration on the subject, and it is only within the last few years that we have certain definite ideas about vitamins and what they will do. There is a great deal more for us to learn about vitamins, and it is fortunate that there are so many scientists that have enlisted their services in this work to continue this study.

We do not look upon vitamins as the only necessary constituent of feeding stuffs. That, of course, would be entirely wrong. There are other products—the proteins, the mineral ingredients, the ash, the carbohydrates, the therms—all playing an important part; but vitamins are just as necessary an adjunct as any one of those constituents, so we must treat the subject of nutrition as a whole. The part I am attempting to present today is the subject of the vitamins, this one phase, so don't think that I am putting all the stress on vitamins and that subject alone and saying that that is the all-important matter in the study of nutrition.

There are, at the present time, four vitamins that are recognized as producing certain results. No one has ever seen vitamins; they have never been isolated in the pure state; we only know what they will do when they are lacking in the diet and then know what the result will be when they are supplied in the diet.

Solubility	*Name*	*Function*	*Source*
Water A	Antiophthalmic	Growth promoting; prevents ophthalmia.	Butter, milk, egg yolk, green leaves, glandular organs, cod-liver oil, yellow corn.
Water B	Antineuritic	Growth promoting; prevents beriberi and polyneuritis.	Eggs, milk, yeast, fresh vegetables, fruits, alfalfa, clover.
Water C	Antiscorbutic	Prevents scurvy.	Fresh canned tomatoes, oranges, lemons, sprouted grains, raw milk from cows on fresh pasture.
Fat D	Antirachitic	Prevents rickets; regulates calcium and phosphorus assimilation and deposition.	Cod-liver oil.

Vitamin A, or fat-soluble A, has a particular function, the antiophthalmic. In other words, if you have a diet which is deficient in fat-soluble A, a characteristic eye disease will develop. It has been studied more particularly with rats, but it has been observed and studied more or less in the various other species of the vertebrates particularly.

The chart indicates where it is found. Those products are not all equal in value in supplying fat-soluble A. Perhaps cod-liver oil is outstanding. Butterfat and milk have a certain value, and that value varies a great deal on the diet which the cow has. The fat-soluble A which is contained in the diet of the cow will influence the butterfat accordingly. A cow or any other animal does not have the power to synthesize vitamins, but can only transmit them from the foodstuffs into the milk or its products. That likewise applies to eggs and other products. However, the meat products are comparatively low even in fat-soluble A.

Water-soluble B is one which we will show you here, giving you an actual demonstration. Unfortunately we do not have the rats here to show you this ophthalmia. Water-soluble B produces a certain paralysis. Here we have it exhibited in the pigeon. Note the condition of this particular pigeon. After the pigeon is slightly excited it seems to be more pronounced. That simply means that while it is in the quiet stage the effects are not so noticeable. Its effect is on its nerves, on the spinal column and in the brain cells. They have deteriorated to a certain extent and death will eventually result. If this pigeon was not fed vitamin straight or some product rich in water-soluble B, it probably would be dead by tomorrow, or the day following at the most.

We have a pigeon here which day before yesterday was in a much worse condition than it is now. If it were not for losing the pigeon, which happens to play an important part in experiments which we are conducting, I would be very glad to turn it loose and show you that it can fly around the room; but I hope you will take my word for it. Had that pigeon not been fed this vitamin product containing water-soluble B it would have been dead today without any question.

Here are other pigeons in various stages not quite so far along. Notice this one does not attempt to fly. It is no tamer than any of the other pigeons; it is just unsteady on its feet.

DR. MOHLER: What means did you use to produce that condition?

MR. PLASANTZ: That condition was produced by feeding those pigeons for about twenty-five days on a diet which is inadequate in water-soluble B, perhaps has no water-soluble B. The product is a commercial pigeon feed which is used not only for main-

taining young, but for maintaining older birds. We took that feed and heated it in an autoclave for an hour under 40 pounds pressure, and killed the water-soluble B. In addition to this food we gave it some polished rice, just like the rice that you buy in the stores for your household consumption, and we also fed it tapioca. It had tapioca and rice and this autoclave product. The product which we have used to bring this pigeon back is some wheat germ, and I will endeavor in a few minutes to feed this one here some of the wheat germ. If you men are back here tomorrow I wish you would take particular notice of the markings of this pigeon, and I feel quite sure the chances are nine out of ten that this pigeon will be alive and in the same condition as that pigeon back there.

By just a little more excitement this pigeon will get to the condition where it will turn cart-wheels and lose all sense of which is top and which is bottom.

This pigeon's throat is paralyzed to a certain extent, and it is unable to swallow food, therefore it is necessary to force-feed it, and not only that, but to give it a drink of water at the same time.

Two grams of this product, wheat germ, are enough to correct that disease. I am not giving exactly 2 grams but approximately 2 grams at this time, and if we haven't killed him he is all right.

The water-soluble B is found in a number of different constituents. The ones that are listed here are not the only sources of water-soluble B—eggs, milk, yeast, fresh vegetables, fruits, alfalfa and clover.

Now as to water-soluble C, the antiscorbutic vitamin. You are all more or less acquainted with scurvy. You know its effects, and I will not treat that so extensively. The experimental animal for demonstrating that is ordinarily the guinea-pig. Fresh pasture, you notice, plays an important part there. Oranges are perhaps the outstanding product that is used a great deal, especially in human nutrition. Babies are given a great deal of orange juice. It is a product that is very meritorious and should be used a great deal. I have known where trouble has been corrected in the livestock industry by feeding certain livestock on oranges.

The fat-soluble D is, in a way, associated with A. It is our newest vitamin. For a long time we felt that fat-soluble A had a certain relation in the correcting of rickets. We thought, in addition to this eye trouble, this eye disease which was so common in rats, that this same vitamin would prevent rickets. Recently it has been shown that the particular products containing fat-soluble A can be so treated through a course of oxida-

tion which destroys fat-soluble A, but will still leave it potent as a corrective against rickets.

This has been worked especially with cod-liver oil. Cod-liver oil can be oxidized for about twenty hours and it will no longer correct it and protect animals against the eye disease. It is still effective in causing lime to be deposited in the bones. Rachitis is nothing more nor less than the deficiency of lime and phosphorus particularly, and the outstanding product for supplying it is cod-liver oil. It may be that cod-liver oil will take quite a jump in price if you gentlemen find cases where you think that there is a deficiency of this particular product in the diet of your animals, or you feel that the animals are more or less affected with rachitis, and you will prescribe cod-liver oil. It is being prescribed more and more in the human family as a corrective against rachitis in children.

Here is a little booklet that has been prepared for another purpose which shows pictures of pigeons before and after they were brought down on this deficiency disease and then corrected by this particular product.

CHAIRMAN KINGMAN: Would any one like to ask Mr. Plasantz any questions on the deficiency diseases?

QUESTION: How does pasteurization affect vitamins?

MR. PLASANTZ: Pasteurization would affect the water-soluble C contained in milk, but would probably have very slight, if any, effect in injuring the water-soluble B or the fat-soluble A.

QUESTION: Does the long-time storage of milk affect it, the same as eggs?

MR. PLASANTZ: Now you are getting into the protein proposition. You are getting away from the vitamin subject. Surely the long-time storage of milk is going to have the same effect from the protein standpoint on the storage of milk that it will on the storage of eggs, because to begin with our milk is not in the pure state; there is more chance for contamination in milk when it is stored than there is in the case of the eggs.

QUESTION: Does it injure milk to warm it for chickens in the winter time?

MR. PLASANTZ: No, not the way you warm it.

QUESTION: Do fresh turnips or anything of that kind contain this water-soluble B?

MR. PLASANTZ: Yes. Root tops are rich; bluegrass is rich.

You veterinary men are not likely to come in contact with animals or birds that are totally deprived of any one of these vitamins. If you did you would immediately recognize these particular symptoms, and you would become alarmed. But you are going to come in contact with feeders who are not practicing the right methods of feeding, who are not feeding a balanced ration, and you will get cases that are just receiving part as

much vitamins as they should have, and that effect is going to be cumulative, and sooner or later these animals are going to be doomed and are not going to reproduce properly.

QUESTION: How is millet?

MR. PLASANTZ: Millet will supply B and a little A, but will not supply C or D. Understand, there are four distinct vitamins, and each of them has a different effect. You have to go to one product to find one, to another to find another, whereas pasture grass seems to be rich in practically all of these, as are green alfalfa and green clover.

On the other hand, when you cure alfalfa you injure the A, slightly reduce the B, and totally destroy the C, in which it is very rich. You take grain and sprout it, and it contains no C, but after it sprouts it is immediately rich in water-soluble C. They were able to protect the armies against scurvy in the recent war by feeding them sprouted grains.

DR. MOHLER: Have you done anything on the mineral deficiency ailments?

MR. PLASANTZ: Of course the D causes the minerals to be absorbed, especially calcium and phosphorus. You might feed an abundance of that, but unless you have this D vitamin there the animal would not have the power of using that calcium, and when you have B along with it it does the work.

DR. FERGUSON: According to that, this feeding of lime salts to cattle in the winter time wouldn't amount to much. You would have to feed the cattle on grass.

MR. PLASANTZ: No, it has some effect. There is some D there, probably a little. You are feeding coconut feed, for instance.

DR. FERGUSON: I mean with the ordinary dry dairy feed in the winter time.

MR. PLASANTZ: It would have some effect, but not near as marked an effect. It is well recognized that most of the cows, especially those producing heavily, are putting out more calcium in the winter time than they are other times. In other words, it is a negative calcium balance; there is more outgoing than there is incoming.

DR. FERGUSON: I understand that by feeding the calcium salts they wouldn't be assimilated to the degree they are in the summer time.

MR. PLASANTZ: Not nearly so.

QUESTION: Will this cod-liver oil work equally as well with a dog with rickets?

MR. PLASANTZ: Yes. I am feeding it to my baby now.

DR. FERGUSON: How does it work in calves?

MR. PLASANTZ: It would probably have a very good effect. I don't know that any experiments have ever been conducted with calves; at least I have no record of such.

QUESTION: Of what particular value is yeast?

MR. PLASANTZ: It is especially rich in B vitamin. Yeast does not have the power to synthesize vitamins. The product in which they have grown and which they have fermented will regulate the amount of vitamins contained in the yeast plant itself. In other words, yeast is not a builder of vitamins. If yeast cultures are grown on a rich corn, or a corn which is rich in vitamins, well and good; but if you raise yeast on a degerminated corn or on molasses you will not have very much vitamin in it. The amount of vitamins contained in yeast is quite a variable factor.

QUESTION: Has the absence of light anything to do with rickets?

MR. PLASANTZ: I couldn't say definitely on that. It undoubtedly has some effect. I feel very sure that light is a factor, and is something which we should consider, though it is probably of lesser importance. I don't know that the scientific work has been carried on far enough to demonstrate the relation of light to vitamins.

QUESTION: Do you make any distinction between yellow and white corn?

MR. PLASANTZ: Yes, I do; a marked difference in favor of the yellow corn. It is questionable whether white corn has any A in it or not. Yellow corn has some A and will, providing the hogs have been on a good range during the summer, lay up enough to tide them over in fair condition; but I doubt if there is enough for reproduction, especially where the mothers bear early in the season, long before they can get on grass.

FOWL TYPHOID—KAUPP

DR. KAUPP: I might call your attention to one of three or four charts which I brought along with me in regard to the study of fowl typhoid, or Klein's disease. Recently we had quite an outbreak so that we could study it each day, and also hospital cases, noting the temperature as well as other clinical symptoms, and I put one of these on the wall. In all, we made a study of 34 cases in regard to the temperature, and I will read you a summary of the clinical symptoms, which would be about all you would care to indulge in, I presume.

The clinical symptoms, including the temperature and respiration were studied in 34 cases, of which 25, or 73 per cent, died and came to autopsy, and 9, or 27 per cent, recovered and were returned to the pens. This percentage of recovery was due to autogenous vaccines which we made from the germ isolated from this outbreak. All birds becoming affected, and not vaccinated, died, while 27 per cent of those that were sick and vaccinated recovered.

Only young range birds from four to five months of age were attacked, and the disease was not arrested by the time the third range flock was attacked. That is to say, we had several range flocks, one right after the other, and it started, we will say, for convenience, in range lot No. 1, and in a couple of days it occurred in the pen adjoining it, and in a couple more days in the pen adjoining that.

In another outbreak just eight miles from here (and we suspect that the sparrow was to blame for carrying this infection, although, of course, we do not know) it attacked the old birds. In that case the young birds were not attacked. I didn't want to leave the impression that this disease attacked only young birds. There were no old birds attacked in this flock that I am relating about now.

The outbreak was a violent one, and spread rapidly. The first day it was observed it was thought to be limberneck, but the reading of the inoculated nutrient agar slants the following morning showed it to be an outbreak of fowl typhoid. Vaccine was hurriedly prepared, and in the afternoon the sick birds and part of the first flock attacked, then only one, were vaccinated. The following day autogenous vaccine was used on the three pens finally paying toll, but it required four days to secure immunity and make inroads on arresting the disease, and finally the last bird died two weeks from the ushering in of the disease.

I had some stock vaccine and hurriedly made a vaccine from the stock culture the first day. The vaccinations were given all young fowls on the plant, and three to four vaccinations were given the sick birds. Two vaccinations were given the adult birds in the end of the plant where the disease appeared, and the balance of the adult fowls were given one injection of 1 c.c. each of the vaccine. In all, 673 range chickens were vaccinated, 647 adult fowls, 11 water fowls (consisting of 9 ducks and 2 geese), 1 turkey, and also 12 pigeons, a total of 1,160 birds.

The symptoms as observed in this outbreak and among young fowls are as follows: In the initial stages the symptoms may be overlooked, if the birds are in any way alarmed, that is, if they become uneasy. If one observes them from a safe distance the birds may show signs of dozing, which, of course, must be differentiated from sleepiness, as in hot weather birds quite frequently in the shade will sleep, even in the daytime. When awakened, and especially when startled to a small degree, the bird does not present a normal facial expression, the head is slightly nervous, and the bird, if it now arises and moves away under stress of disturbance, will show weakness in its gait. These symptoms are progressive until the bird becomes prostrate. In advanced stages the bird when at ease for a moment will

sit with its head and tail down, and when it moves shows great weakness. Loss of flesh is very rapid, three days being sufficient to reduce the bird from a fair range condition of flesh to one of poor condition.

The bird may become partially comatose, and if sitting, the head may fall forward until the beak touches the ground. There is one condition which somewhat simulates limberneck. When I speak of limberneck I always think botulism. Of course birds are susceptible to ptomain poison and other neurotoxins outside of the toxin of *Bacillus botulinus*, which to me show similar symptoms in the initial stages in this disease on account of the fact that it is a very severe neurotoxin and is likely to be mistaken for limberneck.

When the bird lies on its side its head may be curved under its breast. At this stage there is complete loss of use of the muscles of the neck, and the bird is unable to walk. That goes back to the point that in any severe nerve poison which destroys the use of the muscles of the neck, of course, you are going to have a limber neck. The bird may die without a struggle, or it may die in spasms. There is soon observed an unkempt appearance of the feathers and a sulphur-colored discharge from the bowels.

In this outbreak it appears that the minimum period of incubation is about three days, and that four days are required to stop the disease from spreading with autogenous vaccine. In some birds the temperature falls before death, but in others the reverse holds good, the temperature rising. Usually the temperature falls immediately after vaccination, although the reverse may be observed.

The carcass is usually observed to be in emaciated condition. There may be present edema, especially in the thorax, in the region of the heart. The pericardial flood may be increased in quantity; more rarely there may be an abdominal hemorrhage. We found abdominal hemorrhage in three or four of these birds. The liver is always enlarged, a hepatitis congestion; blood drips from a section surface. The liver is pliable and tears easily, which accounts for the internal hemorrhage. The kidneys are congested, and the section surface shows a grayish color, indicating cloudy swelling. The heart is congested, as shown by the blood vessels standing out full and red. The heart presents a parboiled appearance. The spleen is uniform in size. Microscopic pathology: Cloudy swelling is marked in all of the parenchymatous organs. This in some instances is terminated in the dissolution of the parchymatic cells. Congestion, both active and passive, is always observed in the kidneys, liver and heart. This accounts for blood dripping from the cut surface of the

liver. The whole microscopic pathologic picture is a result of intensive toxic poisoning.

The normal temperature of the fowl is approximately 107.4. In the first case on the chart the temperature is 112.5. The highest temperature we have had is 114.5, or 7 degrees of fever, which is a terrific fever. After giving 1 c.c. of autogenous bacterin, the temperature by the next morning had dropped down to 107.4. Then the temperature fluctuated along. On the fourth day the bird was given a second vaccination and three days later a third vaccination, and a day later was returned to the pens.

The next bird died after the first temperature was taken. The first temperature was 111. The third bird died after the first temperature had been taken. The temperature at the time of going into the hospital was 113. The fourth case died after the first temperature was taken, temperature of 110.5.

The next case we have is a little different, starting in with 106.5. These birds, when picked up, were quite hurt. This bird was vaccinated, and the temperature went up instead of down. Usually it goes down, but it didn't happen to do it in this case; I don't know why; but the bird died two days later with a temperature of 109.5. The other cases are similar. In one case, after the vaccination the temperature dropped 2 degrees and remained practically normal until the bird was returned to the range.

I am wondering if there are any questions you would like to ask.

QUESTION: What other disease do you have besides these liver derangements?

DR. KAUPP: Well birds are quite prone to have a condition of hepatitis. Of course in cholera you don't have an enlarged liver, but there you have an acute infectious disease where birds are dying with a sulphur-colored discharge from the bowels, and usually enlarged liver indicates fowl typhoid rather than cholera.

LARGE-ANIMAL CLINIC

DISEASES OF SHEEP—I. E. NEWSOM

CHAIRMAN KINGMAN: I want to introduce Dr. I. E. Newsom, Fort Collins, Colo., who will talk to you on some diseases of sheep. Remember that Dr. Newsom has the opportunity of seeing something over 700,000 feeder lambs and sheep every year. This gives him considerable clinical experience besides his corps of laboratory workers. (Applause.)

DR. NEWSOM: I wrote to a number of different men who I thought would be interested in sheep diseases, and asked them to send particular cases to this clinic. Among those who have

furnished cases was Dr. Butler, of the State Veterinary Department of Montana. Dr. Butler has, for a number of years, been seeing out there in Montana a peculiar disease, one which he believes is separate and distinct from the diseases which we commonly encounter in sheep in this country, and Dr. Butler has been fortunate enough to obtain two of these cases, and has shipped them to us. These will be our first cases for demonstration. Dr. Butler wrote to Dr. A. D. Knowles, who has kindly sent us these two cases.

It is our purpose to look over these two ewes for a few minutes, and then they will be slaughtered, and before I finish with the discussion I hope we shall be able to show you the lesions in these two ewes. I want to call your attention particularly to the drooping of the ears, to the emaciation of the sheep, to the hump of that particular one, the larger one, and also the fact that the temperatures are either normal or below. The temperature of the smaller one is 100.8; the temperature of the other is 102. Notice also the discharge from the nose. There is a slimy discharge from the nose.

Some years ago Dr. Kinsley asked me if I had seen any of these cases, and I told him I had not. He described them as having not only this discharge from the nose, but he said that discharge contained a calcareous material so that the calcareous granules could be felt between the fingers. I haven't been able to determine that that condition exists here, but we have the word of the Montana men that these are typical cases of what they are wont to call chronic progressive pneumonia in sheep.

Not being familiar with this disease myself, I asked Dr. Butler if he could not come down here and talk about these cases, or send some one who could. He was not able to come; he sent me a paper written by Dr. Hadleigh Marsh, pathologist for the Montana Live Stock Sanitary Board.

(Dr. Newsom read a paper entitled "Progressive Pneumonia of Sheep," prepared by Dr. Hadleigh Marsh. This paper was published in the JOURNAL for January, 1923, page 458.)

DR. NEWSOM: I will have to make a very hurried postmortem examination. A considerable portion of this lung is solid. It is light in color so that it doesn't appear to be so much differentiated from the rest of the lung, but you may take my word for it that a considerable portion there is quite solid. Even extending up farther on the inside there is some solidified area also, indicating an inflammatory condition of considerable standing.

There are certain areas in the other lung that are in the same condition; I should say they are hardly as extensive as they were in the first lung. Here is an area that is collapsed and rather firm; an area of some little size here, the apical lobe, in a similar condition that seems to be solidified—no air in it.

It seems to me from the general feel of the whole lung that it is a little firmer than a normal lung should be, and possibly would show small areas of concrete inflammatory condition throughout.

I think that there were no other very noticeable lesions in the carcass. I don't know that I can demonstrate it, but you will find in a very emaciated sheep, as well as emaciated animals of other kinds, in the mediastinum a gelatinous appearance that commonly goes with emaciation. It doesn't have any special significance, of course, in this particular animal.

In Colorado we still have some disease that the old stockmen are wont to call hollow belly, and our diagnosis of that is frequently made on the finding of this gelatinous condition of the fat everywhere where the fat should be associated with emaciation. There is no adhesion, and no evidence of any pleurisy at all.

QUESTION: That disease doesn't show up any except on the lungs?

DR. NEWSOM: Apparently on the lungs.

DR. MOHLER: Are those areas solid enough to sink in water?

DR. NEWSOM: No, it does not sink. There has been some pleurisy in this animal because the lungs adhere to the ribs. This is rather more extensive. This is the larger ewe, the one that was pumping so hard, and we would rather expect the condition to be a little more extensive here. Here the difference in color is quite marked, more so than in the other. The affected area appears darker; very extensive adhesions of the other lung to the ribs, much more so than the first one I took out; and the proportionate area of diseased lung, I suppose, is nearly as great as in the other case.

Yesterday afternoon we took six lambs—five of them you see before you here—and we gave inoculations of a pure culture of *Bacillus oviscepticus* to five out of the six, leaving one as a control. I don't know just which one is the control now, but we will get it located in a moment. The amounts given were 20, 15, 10 and 5 and 1 c.c. This culture was taken out of an incubator a week ago today, and at that time was a 48-hour culture. We have been accustomed to using this culture—our strain No. 33—and being able to kill lambs of approximately this size quite readily with 10 c.c. given in the jugular vein. That was the method of administration here—in the jugular vein.

Of course, we realize that taking a culture at room temperature and leaving it for a considerable length of time may give unusual results. You heard a statement to that effect yesterday in one of the sections, that no one quite knew just how virulent an organism of this kind was at a given time. You might deter-

mine its virulence at a given time, and in a few hours you wouldn't know what its virulence would be.

The peculiar thing here is that the one that got the 10 c.c. died, and the one that got the 15 and the one that got the 20 are alive, and will probably continue to live, because it has been our experience that death usually follows within 24 hours, or prostration is so great at the end of 24 hours that it is very evident that that animal will die.

From the fact that these lambs are not showing prostration, although they do show a little rapidity of breathing, I should say that it is quite probable that not any more of them will die, so that the one that died was the one that got the 10 c.c. in the vein, and not the one that that got the larges amount.

Anyone who has worked with hemmorhagic septicemia organisms understands that there is considerable irregularity in virulence and will not be surprised at the result we got, considering the fact that the culture has been so long out of the incubator. Just why one sheep should die that had 10 c.c., and another one that had twice as much should survive, I do not know, but of course there is a difference in susceptibility of animals. It is not at all likely that there was any difference in virulence of this organism, because all of it was taken out of the same bottle.

I had hoped to have two or three or more cases for examination in order to demonstrate lesions that come from inoculation of pure culture. As you see, I have only one. The lesions that we find in inoculated animals are extremely varied. There may be practically no lesions. In other cases there may be a few hemorrhages and a very large amount of straw-colored fluid in the thoracic and abdominal cavities. In other cases hemorrhages may be very considerable, under the skin, under the pleura, rather rarely under the peritoneum, and under the pericardium. In this case we had a few hemorrhages under the skin, a few hemorrhages in the lung showing under the pleura, some very minute hemorrhages under the pericardium, some reddening of the lymph glands, and some reddening of the stomach. Whether these can be demonstrated at this time I do not know. I made this examination just after noon, and it is possible that due to drying these things will not be readily demonstrated.

You see a little hemorrhage on the neck here, a little reddening, even though it is dry. Of course that was a result of the inoculation. The trachea was pretty well filled with foam, and that is a condition we find in so many field cases that we call hemorrhagic septicemia. Very frequently at the nostril of the dead sheep you find a little mass of foam, oftentimes tinged with blood. This trachea was pretty well filled with foam; it doesn't show so readily now, because it has dried up. The mucous mem-

brane is a little darker than normal, although not so dark as is frequently seen.

The submaxillary lymph glands are somewhat reddened, but not much swollen. The prescapular lymph glands are reddened and somewhat swollen, which is rather common not only to inoculated but to field cases. In field cases of hemorrhagic septicemia we find particularly the prescapular and submaxillary lymph glands very much swollen and very deeply reddened in acute cases.

Those are the lymph glands which particularly show change in this animal. The other lymph glands that I examined were apparently normal. Some few hemorrhages can be noticed under the pulmonary pleura, but not at any considerable distance.

The fourth stomach is turned rather dark now, but it was rather noticeably reddened when the sheep was first opened, and there again is a condition that has caused a considerable interest to us.

For a number of years, we believe that we confused hemorrhagic septicemia with a dietary disorder. Don't understand me to say that we haven't dietary disorders in sheep; we have. We have extreme losses in sheep from dietary disorders. But because of the reddening of the fourth stomach in many field cases we used to say dietary disorder at once, and let it go at that, until finally we got so many cases where there seemed no possibility of attributing it to diet, that is, they were not on full feed of barley, corn or peas or whatever the feed might be, and then when we had so many times, using pure cultures of the organism, reproduced this stomach lesion, that we found that *Bacillus ovisepticus* was capable of producing a gastritis that appeared extremely red, and that the appearance of gastritis didn't necessarily mean a dietary disorder.

I want to take just a few minutes to express my views on hemorrhagic septicemia in sheep. I know very little about hemorrhagic septicemia in other animals, and I may know very little about hemorrhagic septicemia in sheep. We are quite certain that we have diagnosed many cases in sheep as hemorrhagic septicemia that were not so, and I am quite sure that all of us are doing that. Possibly that is true of other animals. We also believe that there is a real hemorrhagic septicemia in sheep, and we have come to the conclusion that in a considerable percentage of field cases we can, with some degree of certainty, tell by the examination, the postmortem, the history, all the factors in the case, whether or not we can isolate from that animal a bipolar organism.

We have a number of dietetic disturbances out there in our feed lots from which we have taken a bipolar organism from

the spleen, lymph glands, heart blood, and even lungs, and have failed in practically all cases.

On the other hand, when we have these enlarged lymph glands, the red trachea, the hemorrhages under the pleura, particularly, we can, in most of those cases, isolate the bipolar organisms.

This dietetic disturbance, whatever it may be, comes not in the first two or three weeks or month after they get into the list, but after the animals are on full feed, are fat and apparently in excellent condition. They die quickly. In those conditions we may have hemorrhages, but the hemorrhages are more apt to become intermuscular. You hold up the thin abdominal wall in those cases, and you find it is just interspersed with hemorrhages, and in those cases where the average man would say that there was no question about it because there are the hemorrhages even more profuse than in what we are calling real, true hemorrhagic septicemia, we haven't been able to isolate the bipolar organism.

So, as I say, we think we are able to accept that the dietetic disturbance comes on full feed of corn, barley, peas. I don't know what relation it has to the diet. We have tried to reproduce it by overfeeding, and have failed. We have put sheep in experimental conditions, under all sorts of peculiar surroundings, with irregularity of feeding, and overfeeding, and all that, and we never could produce disturbance of that kind; and yet we are not able to isolate any organism, but we do know that it comes when they are on full feed; and when the grain feed is cut out that condition stops.

Of course, that is only one. That is probably our chief disease that causes loss that is not the hemorrhagic septicemia in our feed-lot lambs. We have undoubtedly several more.

We make a diagnosis of hemorrhagic septicemia when we find these lesions that I spoke of, and when we can, by inoculation, isolate the bipolar organism from the spleen and the lymph glands and the heart blood, or any one of them we still believe that there is then a hemorrhagic septicemia, and some years it causes very heavy loss and other years not very much.

(*Proceedings to be continued.*)

PRESIDENTIAL APPOINTMENTS

The following appointments have been announced by Dr. W. H. Welch, President of the A. V. M. A.:

Dr. William E. Muldoon, of Manhattan, Kans., has been appointed A. V. M. A. representative on the Board of Managers of the Horse Association of America.

Dr. T. H. Ferguson, of Lake Geneva, Wis., has been ap-

pointed to the Committee on Intelligence and Education, succeeding Dr. J. S. Koen, whose term had expired.

Dr. J. S. Koen, of Bloomington, Ill., has been appointed to fill the vacancy on the Committee on Legislation, caused by the expiration of the term of Dr. F. A. Bolser.

Dr. Wm. M. Bell, of Nashville, Tenn., has been appointed to fill the vacancy on the Committee on Revision of the Constitution and By-Laws, caused by the resignation of Dr. J. R. Mohler.

The Committee on Prevention and Control of Animal Diseases has been announced as follows: Dr. H. W. Turner, Chairman; Dr. George H. Hart, Dr. I. E. Newsom, Dr. A. F. Schalk, Capt. R. A. Kelser.

President Welch has recently appointed a special Committee on Policy, consisting of the following members: T. E. Munce, chairman, and C. E. Cotton, representing the Executive Board; M. Jacob, representing agricultural education and the South; D. H. Udall, representing veterinary education; L. A. Merillat and W. H. Welch, representing the practitioners; J. R. Mohler, the Federal Government, and H. Preston Hoskins, acting as secretary.

COMMITTEE ON REVISION

The Committee on Revision of the Constitution and By-Laws of the A. V. M. A. met with the Executive Board, in Chicago, December 5 and 6, and discussed a number of proposed amendments to the Constitution and By-Laws. A copy of these proposed changes, with the articles or paragraphs of the present Constitution and By-Laws proposed to be changed, has been sent to each member of the Revision Committee and the Executive Board, for further comment or approval, and the same will be published in full in March issue of the Journal, in pursuance of the motion passed at the St. Louis meeting.

ELECTION IN EXECUTIVE BOARD DISTRICT NO. 1

A great deal of interest is being manifested in the election of a member of the Executive Board from District No. 1 (Canada). The first fifty nominating ballots returned to the Secretary's office contained the names of twelve different Canadian veterinarians. Owing to the closeness of the race (at the time

this is being written two votes would change the standing), it seems desirable to keep the polls open the sixty days implied by the by-laws. Therefore, the nominations will close February 11, 1923. As soon thereafter as possible, the Secretary will mail an election ballot, containing the names of the five members receiving the highest number of nominating votes, to each member in good standing in the First District. These ballots should be returned without delay, properly marked, to the office of the Secretary.

DR. HOSKINS'S BIRTHDAY

January 3, 1923, was the thirty-seventh birthday of Dr. H. Preston Hoskins, the Secretary-Editor of the A. V. M. A. He celebrated it by moving into the new offices of the Association, which have been opened in the Book Building (Suite 735-6), on Washington Boulevard, Detroit, Mich. The first visitor to the office was Dr. S. Brenton, of Detroit, who served the Association as President in 1911-1912. It is to be hoped that no veterinarian will pass through Detroit without calling at the office of the Association. If you want to call the office by long distance telephone, the number is Calillic 1037.

An encouraging sign: The Secretary reports that up to January 3, 1923, eleven members of the Association had paid up their dues one year in advance. Who is next?

Another good sign: Up to January 3, 1923, the Secretary reports that he already has on file seventeen applications for membership to be acted upon at Montreal, and the real campaign for new members has not yet been started!

Among those who attended the 24th annual meeting of the Society of American Bacteriologists, held in Detroit, December 28, 29 and 30, 1922, were the following veterinarians: Drs. W. A. Hagan and H. L. Gilman, of Ithaca, N. Y.; Ward Giltner and H. J. Stafseth, of East Lansing, Mich.; S. R. Johnson, of Lansing, Mich.; John Reichel, of Glenolden, Pa.; C. P. Fitch, of St. Paul, Minn.; Donald C. Beaver, Archibald R. Ward and H. Preston Hoskins, of Detroit, Mich.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

THE regular monthly meeting of the Veterinary Medical Association of New York City was held in the Academy of Medicine, New York City, on Wednesday evening, November 1, President Robt. S. MacKellar presiding. The minutes of the October meeting were read and approved.

Dr. W. Reid Blair, who had just returned from an extensive tour through continental Europe, entertained the association with an instructive talk on his experiences in the various countries along veterinary lines. The doctor's discourse was greatly appreciated and brought out a good discussion and a number of questions were answered satisfactorily. The following resolution was proposed by Dr. Blair:

WHEREAS, The American Blue Cross Society, under the direction of its president, Miss Maud Adams, is endeavoring to promote legislation compelling the use of anesthetics in painful operations on animals; and,

WHEREAS, Such legislation, if properly drafted and properly enforced, will contribute to greater humaneness in the handling and treatment of animals; be it

Resolved, That the Veterinary Medical Association of New York City heartily endorse the movement of the Blue Cross Society in its efforts to prevent undue suffering as the result of surgical or other painful operations on animals.

After a general discussion the resolution was seconded and carried.

The single-injection method for immunization against rabies was brought up and a snappy discussion took place. Dr. Ticehurst said he had vaccinated a great number of dogs that were exposed to rabies around Englewood and Tenafly, N. J., none of which came down with rabies after vaccination. Dr. Goubraud said he had vaccinated six exposed dogs successfully lately. Dr. Higgins pointed out that rabies has existed in the United States for a long time, and as the single-injection method had been successful in eliminating rabies in Canada and in Japan, he thought the time was ripe for veterinarians in the United States to advo-

cate to health departments and the public generally the advantages of this method of control.

Under new business, the president brought up the subject of a meeting place for the association. After discussion it was agreed that the Academy of Medicine was most convenient if our finances could stand the rental.

Dr. Clayton proposed that the by-laws be temporarily suspended to omit the $5 initiation fee to stimulate the admission of new members, which was carried.

Dr. Clayton proposed that Section I, Article 8, of our by-laws be amended to read: "And the annual dues shall be $5 per year, payable in advance."

Dr. R. W. Gannett spoke on the advisability of having some outside prominent men in the profession address the meetings.

No further business appearing, the meeting adjourned.

J. ELLIOTT CRAWFORD, *Secretary.*

SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

THE seventh annual meeting of the Southeastern States Veterinary Medical Association was held in Chattanooga, Tenn., Hotel Patten, November 20-21, 1922.

The meeting was opened by an address of welcome by Mayor A. W. Chambliss, Chattanooga, Tenn., and responded to by Dr. Tait Butler, of Memphis, Tenn.

President W. M. Bell, of Nashville, Tenn., delivered his address in an impressive manner and conveyed an optimistic view of the future of the veterinary profession in the South.

The convention was honored with the presence of Dr. W. H. Welch, Lexington, Ill., president of the American Veterinary Medical Association, who delivered the principal address of the morning session. Among the many good points brought out in his address was the possibilities of poultry practice. He substantiated his opinion with his experiences in his own practice. All who heard his address feel sure of a successful year for the American Veterinary Medical Association under his direction as president.

"The Veterinarians' Position in the Advancement of Southern Livestock Industry" was discussed by Dr. Tait Butler, of Memphis, Tenn., editor of the *Progressive Farmer,* who pre-

dicted that the veterinary profession would continue to grow and develop with faster strides than ever before. He also paid a fine tribute to Dr. C. A. Cary and Dr. W. H. Dalrymple, when he said they were the two most useful veterinarians to the profession in the South along the lines not concretely veterinary, as they had educated the people on basic principles of agriculture and livestock production.

Immediately following the morning session a Dutch luncheon was enjoyed by all at the Patten Hotel.

The afternoon session was opened by a paper from Dr. T. P. White, Bureau of Animal Industry, on "Our Swine Disease Situation with Especial Reference to Cholera." His paper brought out a great deal of discussion and many points of interest.

Dr. J. H. Reitz and Dr. W. H. Cheney discussed "Laboratory Diagnosis as an Aid to the Practitioner." Mr. C. E. Brehm read a paper on "Relationship of the County Agent to the Veterinary Profession." He outlined the position that the county agent should have, from the county agent's viewpoint, and we are sure that if the policies outlined by him were adhered to a better feeling would exist between agriculture demonstration agents and the veterinarian.

Quite a unique number on the program was the lantern slide illustrated lecture by Dr. G. A. Roberts, of Sao Paulo, Brazil. In this paper he discussed the common diseases mong livestock in Brazil and showed the possibilities of the profession as he saw it during his three years' veterinary service in that country.

The banquet was held in the dining room of the Hotel Patten at 7 o'clock. Dr. M. Jacob, of Knoxville, Tenn., acted as toastmaster, and every one seemed to have a good time at this banquet.

The following papers were read and discussed at the morning session of November 21: "Fright Disease in Dogs," by M. Jacob and others; "Botulism in Dogs," by Dr. P. C. McLain; "Summary Case Reports of Canine Practice in Dogs," by Dr. W. J. Cross, and "Treatment of Intestinal Parasites in Dogs," by Dr. J. G. Phelps.

At the business session the following officers were elected for the incoming year: President, M. Jacob, Knoxville, Tenn.; 1st Vice President, A. L. Hirleman, Atlanta, Ga.; 2d Vice President, A. G. G. Richardson, Athens, Ga.; 3d Vice President, J. S. Andrade, Huntsville, Ala.; Secretary-Treasurer, John I. Handley, Atlanta, Ga.

The next meeting will be held in Greensboro, N. C., the second Monday and Tuesday of November, 1923.

JOHN I. HANDLEY, *Secretary.*

B. A. I. VETERINARY INSPECTORS' ASSOCIATION

THE following is a report of the meetings held during the last month by the school of instructions for the veterinary inspectors, as instituted by Dr. W. N. Neil, inspector in charge of the Chicago station, which meets in the Government office of one of the local plants each Monday morning. The Chicago branch of the National Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance on various subjects relating to meat inspection. All subjects are presented by inspectors who have had considerable experience in the Bureau. Various pathological specimens of interest, as well as rare conditions found by the inspectors, are collected during the week and held under refrigeration until the following Monday morning when diagnoses and discussions are made.

On November 20, Dr. L. E. Day, in charge of the pathological laboratory, talked on the subject of "Diseases of the Skin." Dr. Day's talk was very interesting and instructive, as it included practically all of the diseases of the skin.

On November 27, Dr. Otto Hornlein, assistant inspector in charge of the Chicago station, read a very interesting paper on the "History of Meat Inspection."

On December 4, Dr. L. E. Day gave a very interesting talk on the blood. The physiology of the blood as well as its relation to diseases was fully discussed.

On December 11, Dr. W. H. Daly, president of the local association, presided at the meeting. Dr. C. M. Lombard read a well-prepared paper on "Diseases of the Osseous System from the Standpoint of Meat Inspection."

At each meeting interesting pathological specimens were presented for discussion and diagnosis. At the last meeting all veterinarians were instructed to make a special study of "Swine Erysipelas" before the next meeting, as specimens of diamond skin disease will be presented, and the relation between the two will be fully discussed.

L. T. HOPKINS, *Secretary.*

ARMY VETERINARIANS MEET

THE Army veterinarians, both active and reserve, at the Sixth Corps Area had a get-together meeting and dinner at the Hotel LaSalle, Chicago, December 7, 1922. About thirty officers were present. Col. W. P. Hill, Chief Veterinarian of the Sixth Corps Area, presided. Col. D. S. White spoke in a delightfully humorous way of his army veterinary experience. Col. L. A. Merillat vividly described many difficulties encountered in his varied experience in France. Lieut.-Col. N. S. Mayo spoke on the Reserve Corps from a citizen's standpoint. Col. Keck and Maj. Christy, line officers in charge of the Reserve Corps activities in the Sixth Area, spoke of the need of reserve officers and the opportunity that the Reserve Corps offers. Maj. Christy stated that the percentage of veterinary officers in the Reserve Corps was much below that of any other branch of the service, and urged veterinarians to enter the Reserve Corps. They will be assigned to units and can take examinations for promotion. Veterinary officers that served during the war can take the examination in much less time than veterinarians coming in from civil life, as their war service counts.

Capt. MacCanachie, of the Canadian Army Veterinary Service, was present as a guest, and related in a delightful way many amusing experiences while he was serving with the British forces overseas.

An organization of Army veterinarians was started. Col. W. P. Hill was made temporary president and Col. L. A. Merillat temporary secretary. It is hoped to make this a national organization similar to organizations in other branches of the service.

Everyone present agreed to do all he could to increase the number of veterinary officers in the Reserve Corps.

A most delightful evening was spent, and it is believed that preliminary steps have been taken that will be of great service to the Army Veterinary Corps, both active and reserve.

N. S. MAYO.

NEBRASKA VETERINARY MEDICAL ASSOCIATION

THE twenty-fifth annual meeting of the Nebraska Veterinary Medical Association held in Lincoln, December 12 and 13, was by far the most successful from every point of view during the existence of the organization.

Headquarters of the association were maintained at the Hotel Lincoln where excellent facilities were obtainable for the literary and social portions of the program.

The morning session of the first day was opened with the rousing address of welcome from Honorable F. C. Zerung, Mayor of the City of Lincoln, with response by Dr. D. W. Hurst, Mayor of Tecumseh. These remarks were followed by the address of the President, Dr. Geo. A. Young, of Syracuse, and with a paper on the "Future of Our Profession," by Dr. O. H. Person.

Dr. R. R. Dykstra, dean of the College of Veterinary Medicine of the Kansas State Agricultural College, whose reputation as a practical lecturer on veterinary subjects is well known, was the last speaker during the morning session, and succeeded, as usual, in holding the interest of every one present to the last minute with his explanation of differential diagnosis of certain cattle diseases that resemble each other clinically.

Following lunch, a special street car conveyed the veterinarians from the hotel to the University farm, where a general clinic was held in the horse pavilion, a place admirably fitted for the occasion. The clinic, in charge of Drs. Perrin, Foltz, and Skidmore, included demonstrations of practical value to the practitioner. The first part of a demonstration in the treatment of sterility in cattle was given by Dr. W. L. Boyd, of the University of Minnesota, using special subjects and selected specimens. Dental nerve blocking, ventral hernia operation, caponizing, Ferguson's operation on hard-milking cows, intravenous medication and blood infusion, ablation of bull's eye, scrotal hernia operation by pleating method, umbilical hernia operation, and an operation on a hermaphrodite dog were participated in by R. R. Dykstra, J. S. Anderson, L. J. Boulier, S. W. Alford, L. V. Skidmore, P. Phillipson, Geo. A. Young, R. C. Gilmore, R. C. Moore, and Fred Collins.

The annual banquet for the veterinarians, their relatives and friends at 6.30 p. m. at the Lincoln Hotel, with Dr. L. Van Es

as the very able toastmaster, was a huge success in every respect, with two hundred in attendance.

In order that the spirit of the season should not be forgotten the banquet room was gorgeously decorated in true holiday style. A great Christmas tree standing in the center of the floor and reaching to the high ceiling was decorated and adorned with many colored electric lights. From the chandeliers, which were draped with colored tissue paper, ran long streamers of evergreen and tinsel, ending at the side walls and forming an attractive arch, under which the banquet tables were spread. At either side of the room and on the platform surrounding the orchestra were numerous smaller trees resembling the large one in the center.

During the sumptuous repast of roast turkey with trimmings favors were passed in the form of paper hats, toy balloons, and horns, which created much mirth and closer fellowship. Several musical numbers during and after the banquet were enjoyed by all, more especially the song created by some poetically inclined individual in our midst which is entitled "When the Roll is Called Up Yonder Who'll Be There?" sung to the tune of "Old Black Joe," and humorously dealing with the appointment of the next State Veterinarian in view of the change of political faith in Nebraska.

The after-dinner speakers included Mr. August Eiche, President of the Lincoln Chamber of Commerce, who extended a welcome to the visitors on behalf of the organization which he represents, followed by a response by Dr. F. R. Woodring, Assistant Chief of the Nebraska Bureau of Animal Industry. Dr. A. R. Mitchell, of Lincoln, member of the executive committee of the American Medical Association, gave the principal address of the evening, pointing out in a very able manner how much the medical and veterinary professions have in common. The speaking program was concluded with a short, snappy talk by Dr. R. R. Dykstra, of Manhattan, Kans.

Dancing until midnight, following the banquet, with music furnished by a four-piece orchestra, ended the first day's program.

Beginning the morning session of the second day the reports of the secretary-treasurer and the various committees were read, followed by the election of thirteen new members, which is evidence of the rapid growth of the association. Practical

papers by Dr. T. P. Rose, of York, and Dr. C. C. Hall, of Omaha, carried many helpful pointers to the veterinarians. The second part of Dr. Boyd's lecture on sterility in cattle, illustrated by lantern slides, covered a subject of such vast importance, given in such an efficient way, that this alone was well worth the time given by every one in attendance. The election of officers for the ensuing year resulted as follows: D. W. Hurst, of Tecumseh, President; Elmer Watkins, of Cambridge, Vice President; F. R. Woodring, of Lincoln, Secretary and Treasurer.

During the afternoon a number of subjects of merit were discussed, the titles of which were: "Crow-foot Poisoning in Hogs," "Some Conditions in Swine Met With in Practice," "Coccidiosis in Sheep," "Relation of Soil to Animal Diseases," "State Veterinarian's Office and the Practicing Veterinarian," "Case Reports," and "Observations in Animal Disease Control Work," by the following veterinarians in their respective order: Drs. D. W. Hurst, Maurice C. Hall, H. M. Martin, L. Van Es, D. D. Tobias, C. H. Hays.

The lecture on "Parasitic Diseases of Live Stock and Control Measures," by Maurice C. Hall, of Washington, D. C., explained in minutest detail those conditions met with in every-day practice on which the veterinarian is as a usual thing not so well informed as along some other lines; therefore the information gained was of inestimable value.

Miscellaneous business and appointment of committees followed, with Grand Island selected as the next meeting place.

The committees on local arrangements with W. T. Spencer, of Lincoln, as general chairman, and Mrs. Carl J. Norden, as chairman of the ladies' committee, are to be especially commended for the efficient way in which this portion of the meeting was handled, everything working with clock-like precision, which added much to the success of the meeting.

At 10 a. m. Tuesday an informal reception was held for the ladies in the English Room of the Lincoln, followed by a get-acquainted luncheon at 11.30 a. m. The afternoon was taken up with a visit to the Eiche Greenhouses, the largest in the State where 40,000 roses were found to be in full bloom. After an inspection of this wonderful place, the ladies proceeded to the Gooch mill, bakery and macaroni factory, where many of the mysteries in the manufacture of grain-food products were seen and explained by courteous guides. At the close of the inspec-

tion the guests were favored with a buffet luncheon at the mill, following which the ladies were returned to the hotel in automobiles furnished by the Lincoln Auto Club.

Wednesday was crowded full for the ladies with a morning shopping tour and informal reception on the balcony of the hotel and at 12.30 a luncheon was served by the Lincoln Chamber of Commerce in the club rooms with the visiting ladies as guests. A matinee at 2.30 o'clock at the Orpheum Theatre ended a most delightful 'two-days' entertainment.

During the session a Ladies' Auxiliary was formed with the election of Mrs. S. W. Alford, of Lincoln, as President; Mrs. J. S. Anderson, of Aurora, Vice President, and Mrs. A. A. Anderson, of Grand Island, Secretary.

Thus ended the successful twenty-fifth meeting of the Nebraska Veterinary Medical Association.

F. R. WOODRING, *Secretary.*

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION

THE Western New York Veterinary Medical Association held its annual meeting December 15, in the building of the Erie County Society for the Prevention of Cruelty to Animals, Buffalo, N. Y.

The meeting was called to order at 1.30 p. m. by President E. L. Volgenau, with clinics as the first order on the program. Clinics consisted of lamenesses in horses and demonstration of the roaring operation by Dr. J. N. Frost, of Cornell University; complete paralysis in a cat, ovariotomy of a bitch by the flank operation, by Dr. J. L. Wilder, Akron, N. Y.

Business meeting convened at 4 p. m., thirty-five members responding to the roll call. Two new members were added to our list, which now totals seventy.

The following officers were elected for the year: President, E. C. Cleveland, Cattaragus; Vice President, Chas. D. Blaser, Buffalo; Secretary-Treasurer, F. F. Fehr, Buffalo; two Directors, E. L. Volgenau and H. D. Martin, both of Buffalo, to serve a term of three years.

At 6.15 the meeting adjourned for dinner at the Old Teck Cafe, where the members were joined by the ladies and enjoyed a bounteous repast.

After dinner the ladies, who had been entertained during the afternoon at the B. G. H. Club, with Mrs. F. F. Fehr as hostess, were escorted to the theatre, and the meeting reconvened at S. P. C. A. Hall.

Dr. E. T. Faulder, of Albany, gave a talk on "The Eradication and Control of Bovine Tuberculosis," and showed the progress being made in different states under the accredited herd plan. Dr. R. F. Frick, Erie County Farm Bureau Director, spoke on the cooperation and assistance of the Farm Bureau to the Federal, State and local veterinarians in controlling tuberculosis.

After several interesting case reports were presented by members, the meeting adjourned to meet at Akron, N. Y., the second week in July, 1923, as the guests of Dr. J. L. Wilder.

Visitors were E. T. Faulder, Albany; B. J. Cady, Olean; J. N. Frost, Ithaca; H. M. Starling, representing the H. K. Mulford Co.; W. S. Anderson, representing the Cassius Way Co., and Harold Smith, representing the Tilden Co.

F. F. LEHR, *Secretary.*

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS

A meeting of the Metropolitan Division of the N. A. B. A. I. V. was held in Room 303, U. S. Barge Office, New York, N. Y., on December 15, 1922. Twenty members were present. Dr. Albert Long presided. After completing the regular order of business, Dr. N. L. Townsend supplemented News Letter No. 1 with personal impressions of the convention of the N. A. B. A. I. V. held in St. Louis, which he attended as Vice President at Large. The next order of business was a paper presented by Dr. M. J. Murphy on "Tuberculosis with Particular Reference to the Mode of Entrance and Distribution of Tubercle Bacilli in the Body." This interesting and instructive contribution to our knowledge of tuberculosis was fully discussed by nearly all members present. Dr. Murphy's paper was in line with the policy of this division which is to devote a portion of its time to the discussion of subjects considered of most importance in the work of veterinary inspection. Such discussions add to the interest our members take in the meetings and have a tendency to increase the efficiency of Bureau work. The program com-

mittee, consisting of Drs. N. L. Townsend, R. M. Mullings and M. J. Murphy, intimate that there is a possibility of arranging a program for the January meeting that will be of exceptional interest. EDW. L. SANDER, *Secretary.*

CONFERENCE OF TICK-ERADICATION FORCES

A conference of Federal and State employees engaged in the work of eradicating cattle tick from the South was held at the Texas Hotel, Fort Worth, Texas, January 9 to 11. The meeting was also attended by State livestock sanitary officials from those States which remain infested with the tick.

Although the meeting was called at the instance of the officials of the Bureau of Animal Industry, the program was largely in the hands of those representing various State organizations which are interested in seeing the cattle industry of the South freed of the fever tick.

Matters pertaining to the administration of State laws and regulations relating to tick eradication were discussed. Preliminary tick eradication by means of motion pictures, posters, and other means of properly informing cattle owners as to the advantages of eliminating the tick as a "star boarder" from their cattle was brought before the conference by those who have had successful experience along this line. The organization of Federal, State and county forces, to obtain the most efficient cooperation of all forces engaged in the work, was also discussed.

It has been found in past years that such conferences of those actively engaged in tick eradication prove of great benefit to the campaign. General discussions of experiences in the campaign during last year enable the workers to plan their work effectively for the coming year.

MARYLAND VETERINARY MEDICAL ASSOCIATION

The regular semi-annual meeting of the Maryland State Veterinary Medical Association was held on Thursday, January 18, at the Medical Hall, 1211 Cathedral Street, Baltimore, Md., beginning at 10 o'clock a. m.

The program was as follows:

Forenoon: Election of officers and reports.

Afternoon: Address by Dr. E. C. Schroeder, Superintendent of the Bureau of Animal Industry Experiment Station at Bethesda, on "Contagious Abortion of Cattle," followed by an address by Dr. I. K. Atherton, Inspector in Charge of Hog-Cholera Investigation for Maryland, on "The Control of Hog Cholera."

Both of these gentlemen are well known to our members and their addresses showed that much study and investigation had been given to their respective subjects.

HULBERT YOUNG, *Secretary.*

CONFERENCE OF VETERINARIANS AT PENNSYLVANIA

A conference of veterinarians will be held on February 27 and 28 at the School of Veterinary Medicine, University of Pennsylvania. The program, as far as completed, includes bovine pneumonia, ascaris in swine, other important diseases of swine, equine influenza and contagious pneumonia, some of the ailments peculiar to Thoroughbreds and Hunters, and poultry diseases of special interest. All veterinarians are cordially invited to attend. The Alumni Society has arranged to give a smoker on the evening of February 27 to those attending the conference. The program will be printed later and copies will be mailed on request.

The Paris Society of Comparative Pathology has adopted the following resolution as a means of combating the danger of the spread of echinococci:

"*Resolved*, That private slaughterhouses be suppressed and be replaced by communal abattoirs.

"That the legislative enactments concerning the seizure of stray dogs and the destruction of animal carcasses be strictly enforced.

"That dogs should not be permitted to enter the flaying rooms at all, and the abattoirs to only a limited extent, as controlled by definite regulations.

"That the declaration of all animals discovered in the abattoirs to be infested with echinococci shall be obligatory."

NECROLOGY

A notice of the death, early in November, of Dr. James B. Asheraft, a professor in the College of Veterinary Science, Las Banos, Laguna, Philippine Islands, has just been received. The deceased was a member of the American Veterinary Medical Association, having joined the Association at the Denver convention in 1921.

A resolution of the Philippine Veterinary Medical Association on the death of Dr. Asheraft is as follows:

WHEREAS, Dr. James B. Asheraft was elected to membership in the Philippine Veterinary Medical Association on February 4, 1921;

WHEREAS, He was an active and inspiring promoter in the progress of this Association;

WHEREAS, God, in His great wisdom, willed it that we be deprived of his warm friendship and valuable assistance in the progress of veterinary medicine in the Philippine Islands; be it, therefore,

Resolved, By the Philippine Veterinary Medical Association, as it is hereby resolved on this 14th day of our Lord, to unanimously convey our sympathy to the family of the deceased for this irreparable loss; be it further

Resolved, That copies of this resolution be spread on the minutes of the Association and sent for publication to one local paper and to the JOURNAL OF AMERICAN VETERINARY MEDICAL ASSOCIATION.

The Committee on Resolution:

GREGORIO SAN AGUSTIN.
MIGUEL MANRESA.
A. K. GOMEZ.

Dr. F. A. Bolser died suddenly at his home in Newcastle, Ind., in the latter part of November while undergoing a major surgical operation.

Dr. Bolser enjoyed an enviable reputation as a practitioner and was known widely among the members of the profession throughout the United States. As Assistant State Veterinarian of Indiana he rendered valuable service to the livestock industry through the energy, decisiveness and good judgment he displayed in his activities to help free his State and country of foot-and-mouth disease in 1914 and 1915. He was elected vice-president of the A. V. M. A. several years ago and

was selected to serve on the A. V. M. A. Legislative Committee, which was most successful in obtaining official recognition of veterinarians in the U. S. Army service. He was a fluent speaker and wrote a number of scientific articles and papers on diseases of animals. Two papers that attracted favorable attention were entitled "My Experience with Hog Cholera," and "The Importance of Hog Cholera and the Production of Hog-Cholera Serum."

Dr. Bosler was 65 years old, and it is an interesting coincidence that he died on the forty-second anniversary of his marriage. Dr. Bolser is survived by a wife and son, Dr. Harry Bolser. His many friends join THE JOURNAL in extending sympathy to his family in their bereavement.

Dr. Joseph W. Klotz died of apoplexy on December 19. He was a resident of Noblesville, Ind., and at the time of his death was president of the Indiana Veterinary College, located at Indianapolis, Ind. In connection with his administrative duties as president he taught surgery and obstetrics in the college. In closing his course of lectures for the first half of the school year on December 19, he wished the members of the class a pleasant vacation and a merry Christmas. The announcement of his death a few hours later came as a great surprise, as he seemed to be in good health and spirits when he left the lecture room.

Dr. Klotz was a graduate of the Ontario Veterinary College in the class of 1891. His ability, his geniality and his straightforward business methods inspired confidence, and he was soon successful in building up a large practice in the vicinity of Indianapolis and Noblesville. He was one of the most prominent veterinary practitioners in his State and ranked among the foremost veterinary educators in this country. He was too busily occupied with his practice and school work to have much time for leisure or writing for scientific publications, but his example was an inspiration to the students of the college, and he is quoted in many sections of the country by the graduates of the Indiana Veterinary College who are applying his teachings in their practices.

As a citizen Dr. Klotz took a deep interest in the welfare of his community. He was a member of a number of fraternal organizations, including the Masonic Order, which conducted his funeral services. He joined the A. V. M. A. in 1894 and took an active interest in the affairs of the Association.

MISCELLANEOUS

RIDING-HORSE SHORTAGE

By G. A. Bell, *Chief Animal Husbandman, Remount Service, Quartermaster's Corps, United States Army, Sacramento, Calif.*

THE following appeared in a comparatively recent issue of the *Breeder's Gazette* under "Market Movement sand Values":

"There is a persistent demand for riding horses, orders coming from many small towns and cities scattered all over the East and the Mississippi Valley, with no immediate prospect of execution."

This same persistent demand exists in practically every part of the United States. The writer, during the past year, has been in nearly every section of this country; from the New England States to Florida, from New York to California and from Montana to Texas; and everywhere the dearth of high-class riding horses is very apparent, and this, in face of an increasing demand, makes the situation acute.

The writer has been frequently asked, "Where can I buy a carload of good polo mounts? Where can I get some good riding horses for the members of our riding club? Where can I get some good jumpers or some good cross-country horses?" All of these classes require a high-class riding type. Many a dealer is scouring the country picking up a good one here and a good one somewhere else, but to find a large number of good ones for sale in any one community is impossible.

Many riding clubs have been organized during the past few years and such clubs are continuing to be organized. Horseback riding is growing in popularity rapidly, as the beneficial results from such a healthful exercise and such an exhilarating sport are becoming more and more apparent. There is a keen pleasure in being in the saddle that is afforded by few other sports. Both adults and children are taking to horseback riding as a pleasure, in greater numbers than ever, and most of these children will continue to ride for many years, thus continuing the demand for saddle horses.

Where are these riding horses coming from? They do not

exist at present, and there was never a better demand nor better prices offered for really high-class useful horses that can go out and do a satisfactory day's work. Not only are these horses wanted for pleasure purposes, but also on the cattle ranches for work in handling cattle. It is almost impossible to purchase, at a reasonable price, one of the good cow horses from a rancher. He realizes the scarcity of the good ones and needs them for his own use.

There is but one solution to the problem and that is for the ranchers, farmers and breeders to produce the needed animals, both for their own use and to supply the city demands. There are a large number of mares in various sections of the country suitable for producing riding horses, but owing to the scarcity of suitable stallions, but a small number of these mares can be bred.

The Remount Service Q. M. C., U. S. A., is doing much to relieve the situation by placing high-class stallions in selected communities where the conditions are satisfactory. There are about 260 of these stallions now available and, while this is but a small per cent of the number needed, the result in the end will be to relieve, quite materially, the acute shortage of riding horses. As it takes six years to produce a really serviceable horse, the present shortage must remain for several years, but in the meantime these good animals are being produced and encouragement is being given to the production of a horse to meet commercial demands and to build up a reserve supply that will be available to meet a war emergency.—*From The Remount, vol. 3, no. 5, January, 1923.*

Silage odors are absorbed largely through the body of the cow rather than from the air, according to tests made by the United States Department of Agriculture. However, these odors may be practically or entirely removed by the aeration of the milk while it is still warm. Rather heavy feeds of silage may be given to cows one hour after milking without any undesirable flavors or odors passing into the milk. When green alfalfa was fed in relatively large quantities one hour before milking marked flavors and odors were noticed in the milk, but when as much as 30 pounds per cow was fed after milking there was no effect on the milk from the next milking.

DR. WM. HERBERT LOWE
Of Paterson, N. J., One of the Leading Practitioners on the Atlantic Coast and President of the A. V. M. A. in 1905-1906

LIFTING THE EMBARGO

Both Houses of Parliament have passed the new legislation which endorses the earlier decision of the Commons to remove the embargo upon Canadian store cattle. No doubt, in deference to the strong opposition of breeders in this country, and likewise to the critical state of agriculture, that legislation has been rendered as harmless as possible to their interests while fulfilling the "pledge" of which so much was heard. Of course, the new legislation which is proposed does not render us so free from possible attacks of disease as does complete exclusion, but it is satisfactory to note that a wider issue has not been accepted and that it has been recognized that the occasion could not be used as a means of opening the ports to all parts of our far-flung dominions. The only part to which we take objection is that of permitting considerable latitude to the Ministry of Agriculture to allow the importation of breeding stock. We prefer the old system under which only for special reasons could that proposal be put into operation, for those who are acquainted with the stock-breeding industry know quite well that there is no need to introduce breeding stock from other countries. Even the special occasions are not vital. They are mainly applicable to breeds which have been so recently established that they are still uncertain about type, or to pigs of declining constitution. The great mass of stock breeders are practically independent in this respect, and their work is so widely recognized in other countries that the boot is really on the other foot and these countries come to us.

Ireland, no doubt, suffers because of her aspirations after a new status, but it is one of the penalties apparently which is incidental to the new relationship. So far as the British breeder is concerned (and he is the main person to be consulted), it is satisfactory to note that Canadian importations must be identifiable and must have indelible marking. In the course of the debate it was hinted that to complete legislation an extension of the Merchandise Marks Act shold be contemplated next Session. We take that to mean that the marking of meat must follow as a reasonable protection to the public and to those who breed. The butcher clamored for this cheaper meat. Let him now purvey it. If the Government completes its legislation in

this respect, no one will be much the worse; but if it fails to do this, then a new blow has been aimed at British stockbreeding, and it has been hard hit already. We suggest that the bodies which put up such a good fight on behalf of the British stockbreeding interest when the Canadian cattle agitation was at its height should finish their work by urging this new step upon the Government. The "home-killed" ticket must be entirely abolished and a distinction must be drawn between animals which are bred and fed at home and those which are imported and fattened here. The butcher must not be allowed to fill his pockets at the expense of the British home producer and the public. * * *

The Bill is an effort to fulfill what many regarded as a pledge, but a few noble lords seem to think that its principles should be applied to other Dominions. It was stated that what the British farmer had to fear was not cattle on the hoof, but meat importation. If that is so, why encourage the revival of a trade in livestock that must be uneconomic and even cruel because of the length of the journey. We sincerely hope that no imperial pledges will be given in the face of the known views of those who breed stock and of the House of Commons which has refused sanction to a wider application of the Bill.—*Editorial in Farmer and Stock Breeder, London, Dec.* 18, 1922.

LIVESTOCK STATISTICS

Figures show that the United States has but one-sixteenth of the world's population, but it has one-sixth of the world's livestock, approximately as follows:

One-half of the world's 9,000,000 mules,
One-third of the world's 169,000,000 swine,
One-fifth of the world's 100,000,000 horses,
One-seventh of the world's 492,000,000 cattle,
One-ninth of the world's 465,000,000 sheep.

Statistics indicate that the United States ranks fourth in the per capita consumption of meat. The following table shows the figures for the principal meat-eating nations of the world:

Country	Lbs. meat	Country	Lbs. meat
Argentina	281	Belgium	70
Australia	263	Netherlands	70
New Zealand	213	Greece	68
UNITED STATES	142	Austria-Hungary	64
Canada	137	Norway	62
United Kingdom	120	Sweden	62
Germany	115	Poland	62
France	80	Russia	50
Denmark	76	Spain	49
Switzerland	75	Italy	47

A study of the trend of human and livestock population from 1850 to 1922 shows that human population has had the greatest increase, that the number of swine is the most variable, and that sheep show the greatest general decline. The relative positions of the curves in 1922 indicate more and more difficulty in supplying our ever-increasing population with sufficient meat products, and at the same time maintaining a surplus of these products for export.

A study of per capita meat consumption in the United States from 1907 to 1922 shows a considerable decline. The consumption of veal is about equal to that of mutton and lamb, and as a rule slightly more pork is consumed than beef.

The most recent statistics on beef and dairy cattle in the United States show that beef cattle have undergone more fluctuation and that at present beef and dairy cattle are about equally numerous.

The livestock industry of any nation acts as a great storage reservoir for its surplus grains in years of plenty, and its grasses and forage crops that can not be eaten by man. It is a significant fact that no great meat-eating nation has ever suffered famine from crop failure.

"HORSE IN MOTION," NEW FILM, ANALYZES MOVEMENTS

You have seen a horse walk, trot, pace, gallop, run, and jump, but do you know just how he does it? You can learn how from a new United States Department of Agriculture motion picture, "The Horse in Motion."

This one-reel film, sponsored by the Bureau of Animal Industry, is an analysis by means of a high-speed camera of all the important gaits of horses. The gaits are first shown at normal speed, followed by the retarded action, one-eighth of normal. The normal pictures were made sixteen to the second, but the slow pictures were made 128 to the second. Among the types of horses shown are draft animals, pacers, trotters, hunters, runners and cavalry horses.

The technique of the jumps is demonstrated by Dandy Dude, owned by Gen. John J. Pershing, who was present at the first showing of the film in Chicago, before the Horse Association of America. The movements of cavalry horses are shown by three troops of United States Cavalry in a stirring charge on the parade ground at Fort Myer, Va.

"The Horse in Motion" will be circulated through the Department of Agriculture's film distribution system. Copies may be bought by authorized purchasers at the cost of printing.

Dr. J. A. Allen, Animal Pathologist, Canadian Health of Animals Branch, attended the Fox Show held in connection with the Royal Winter Fair at Toronto, and reports that all the foxes were examined before being allowed to enter the show building. Out of approximately 300 animals only 5 were rejected.

Strict sanitary precautions were observed throughout the period of the show, and exhibitors were required to disinfect the show cages daily. The tongs used in handling the foxes during the time they were being judged were boiled before using on other animals. The foxes have been returned to their ranches without any fatalities.

Dr. Robt. Barnes left Ottawa on December 3 for Brantford, where he delivered an address on "Food Inspection" before the Kiwanis Club. He then proceeded to Chicago to attend the twenty-sixth annual meeting of the United States Live Stock Sanitary Association.

On December 12 he visited Clarksburg, Ontario, and addressed a meeting of the "Farmers Section—Clarksburg Board of Trade."

Mr. C. S. McGillivray attended a meeting of the New York Canners' Association, held in Rochester, N. Y., on December 7 and 8.

Dr. R. E. Cropper, formerly of Cartersville, Ga., has moved to Winchester, Ky.

Dr. Geo. W. Winslow has taken up his residence at Ontario, Oreg., having moved from his former location in Grand Forks, N. D.

Dr. E. C. W. Schubel, who has been in practice at Danville, Ill., for a number of years, recently changed his location to Reading, Mich.

Dr. A. E. Slocum is now a resident of Sioux Falls, S. D., having formerly practiced at Longmont, Colo.

Dr. W. E. Frink, who for many years enjoyed a lucrative practice at Batavia, N. Y., has moved to the sunny land of southern California, and has located at Hollywood.

Dr. A. H. Davison, formerly in practice at Hume, Ill., is now located at 1010 N. Market Street, Urbana, Ill. He has been employed by Champaign County (Ill.) in tuberculosis-eradication work.

Dr. A. H. Quin, Jr., has been transferred from sales work in eastern Iowa, for the Fort Dodge Serum Company, to the home office in Fort Dodge, where he will act as assistant sales manager and conduct field investigations.

The Annual Report of the Department of Agriculture of the Union of South Africa contains a statement of Sir Arnold Theiler, Director of Veterinary Education and Research, that his laboratory has commenced the distribution of the live contagious abortion vaccine to the farmers of that country.

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PROPOSED AMENDMENTS

In this issue will be found the minutes of the meeting of the Executive Board, held in Chicago, in December, together with the minutes of two joint meetings of the Executive Board and the Committee on the Revision of the Constitution and By-Laws. Every member of the Association should consider it his duty to read these pages carefully.

It will be recalled that at the meeting in St. Louis, last August, the Committee on Closer Affiliation with State and Provincial Associations made its report, which has already been published in the Journal (page 100, October 1922). This report contained a recommendation that a special committee, consisting of the President of the Association and four other members, be immediately appointed to study the details of the plans submitted, in conjunction with the Executive Board, and that this report (of the special Committee on Closer Affiliation with State and Provincial Associations) should be considered as a written notice to the Association of a proposed revision of the Constitution and By-Laws at the next annual (1923) meeting.

The Committee which was appointed by Ex-President Kinsley (with one change) met in Chicago, in December, to draft proposed changes in the Constitution and By-Laws. This committee

later met with the Executive Board, for the purpose of jointly considering the proposed amendments. Numerous changes and additions were made at the first joint meeting of the two bodies, and the Secretary was instructed to prepare a draft of the proposed amendments, together with those sections of the Constitution and By-laws which it was proposed to amend. The Executive Board and Revision Committee met a second time, to consider further these proposed amendments. These were taken up seriatim and discussed. It was agreed upon the part of those present to have the Secretary prepare a new draft of the proposed amendments and submit a copy to each member of the Executive Board and of the Revision Committee, for approval, before publication in the Journal. This has been done.

In fairness to all, attention is directed to the fact that some of these proposed amendments are looked upon favorably by all the members of both the Executive Board and the Revision Committee, while a number of these amendments have failed to receive the unanimous endorsement of all those present at the joint conferences, and when it is stated that the final draft of the Secretary was approved, it means only that the Secretary correctly interpreted and worded the proposed amendments as expressed by the authors and approved by a majority of those in conference.

Attention has been directed to the question of the legality of acting upon any of these proposed amendments at the coming meeting in Montreal, for the reason that Article 6 of the Constitution and By-Laws provides that, "*Any amendments to this Constitution shall be proposed in writing at an annual meeting and referred to the Executive Board for recommendation or otherwise; but such amendments shall not be acted upon until the next following annual meeting, nor shall they be adopted finally except by the votes of at least two-thirds of the members present and voting.*" Article 20 of the By-Laws provides for the amendment of the By-laws according to the same procedure as provided for amending the Constitution. The By-Laws may be suspended temporarily by a vote of three-fourths majority, but such suspension shall not apply to the section covering amendments. Some of our members lean to the opinion that these proposed amendments cannot be acted upon legally at the next meeting, in Montreal, the only amendments which can be acted upon legally at that time being those submitted by the old committee at the St. Louis meeting.

VETERINARY EDUCATION

Is higher veterinary education on trial? For many years the teachers and research workers on animal diseases in the Land Grant Colleges and certain practitioners saw very clearly the necessity for better veterinary education. They recognized that the important and difficult problems connected with the prevention and treatment of animal diseases could not be solved without a knowledge of the laws that govern them and the practical application of this knowledge. These men understood the close relation of veterinary medicine to animal husbandry and public health. Further, they believed that veterinarians, possessed of educated minds and disciplined in the sciences of veterinary medicine, would be invaluable advisers on all matters pertaining to animal health and disease, They made an earnest effort to raise the standards of veterinary education in this country. They saw that, as in other learned professions, there are difficulties to be overcome, discouraging situations to be faced, and pessismism to be dispelled.

In 1918, the War Department ruled that veterinary schools whose graduates were to be eligible to the Army must have at least high-school graduation for entrance, a professional course of four, full, academic years and adequate facilities for teaching not only the basic sciences but also practical medicine and surgery. The Federal Bureau of Animal Industry took similar action relative to its service. This was in accord with the ideals of the American Veterinary Medical Association.

The first, peace-time matriculation of students after the adoption of these standards, by those schools that did not already possess them, was in 1919, when there was a good registration but, as expected, not equal to pre-war days. In 1920, there was a marked decline in the number of matriculants and in 1921 the reduction was still more pronounced. This year there is no appreciable gain. The drop in the number of students is not more striking, however, than in the number of veterinarians. In 1910, there were 11,552 licensed veterinarians and in 1922, there were 8,692 graduate veterinarians in the United States, according to a recent estimate made by Dean White. There are retiring, for natural causes, about 400 veterinarians annually, and to take their places the schools can supply approximately 125 each year for the next four years.

The veterinary student situation suggests a possible shortage

of veterinarians, The serious effect of such an eventuality has led a few men to believe that the higher requirements are responsible and that the remedy consists in a return to lower standards. Such a course might fill the classrooms, but it would bring disaster to the profession. The responsible veterinarians, and the live-stock owners as well, would not permit such a step backward. They realize that every inch of progress gained must be held tenaciously to avoid a wearisome and retarding repetition of the former struggle for high standards. It is the common experience of professional schools that an advance in requirements is followed by a decrease in the number of students and then an influx of better-prepared men.

There are a number of factors that explain the present situation. The advent of the motor car has eliminated the driving horse; the unfavorable economic conditions that have prevailed, especially in the rural districts, and the extension of the accredited-herd plan for the control of bovine tuberculosis from the *pure-bred* herds, for which it was originally approved, to all cattle, have tended to discourage the practitioners in the profession to such a degree that many of them have left it with the result that in some localities the situation appears to be serious. These conditions which have had a discouraging effect are, from their very nature, with the exception of the automobile, temporary. They are the products of changed economic conditions and the effect of the World War.

The financial situations in the rural districts must improve. The demand for dairy products is increasing and state veterinary medicine will not prevail at the detriment of animal-owners or practitioners. The scientific principles of veterinary medicine, efficiency in service and economy will determine the course that will become permanent. The relation of live stock to the economic prosperity of the country is the same; the total number of animals is as large; the sporadic diseases and injuries are as numerous; and the need for veterinary service is as urgent today as in pre-war time. The facilities for service, however, have made it possible for a practitioner to meet the demands of a greater number of clients. The reduced number of students, therefore, may be a blessing, for in the general shifting of things a smaller number of better prepared veterinarians may be all that the demand requires. The free tuberculin-testing that reacts against the practitioner today will, according to the plan, give him increased work in the near future.

No, higher veterinary education is not on trial. It is the educated and trained veterinarians who are standing firm on the platform of professional ethics and efficient service who are holding the ideals of the profession against the onslaught of theories and actions that accompany *post-bellum* adjustments, and that would bring disaster to the animal husbandry of the country if it were not for their stabilizing influence. Veterinary education presents many problems in the development of adequate professional knowledge and a system of imparting it that will inspire young men with the ideals of true service. These questions are being considered and will be solved eventually, by those who have a vision of the "fitness of things" and the veterinary needs of the great animal husbandry of the land.

V. A. M.

WHAT IS CANINE DISTEMPER?

Veterinarians are experiencing a great deal of difficulty at the present time in the treatment of a diseases (or disease) of dogs called canine distemper. There seems to be almost universal dissatisfaction with the results being obtained with biological products in the treatment of this disease. We say "disease" rather guardedly, for the best opinions lean to the belief that veterinarians are facing more than one disease prevalent among dogs at the present time. Some veterinarians do not hesitate to say that there are at least two distemper-like diseases prevalent among dogs. Other practitioners, not quite so conservative, go further and say that there are three or possibly four of these diseases, which, for want of a more careful diagnosis, are called distemper.

It is now something like fifteen years since Ferry isolated *Bacillus bronchisepticus*. This work was subsequently confirmed, in this country by the findings of Torrey, and abroad by the researches of McGowan. Since that time *Bacillus bronchisepticus* has been accepted as the causative agent of canine distemper in this country, and all present biological products are derived from this organism. The filterable virus of Carre is still believed by some to be the etiological factor in canine distemper, particularly abroad. It must be said that *Bacillus bronchisepticus* is an organism which is undoubtedly responsible for an infectious respiratory disease of dogs and of other small

animals, having been isolated from a number of different species by various investigators at different times. This fact is sometimes held against *Bacillus bronchisepticus* being the specific cause of canine distemper.

Many dog owners and veterinarians feel that more research work should be done on this disease. It is true that very few laboratories have at their disposal any funds which may properly be utilized for the investigation of dog diseases. The investigations of Ferry were conducted in a commercial laboratory, while those of Torrey were conducted in a state university, the work being made possible by funds raised among wealthy dog fanciers. With so many of our veterinarians in the cities devoting their time almost exclusively to small animal practice, and with the very large number of persons interested in dogs, financially and otherwise, it would appear that some concerted effort might result in raising a fund which could be used by some trained animal pathologist in a well equipped laboratory, to conduct further researches into the diseases of the dog, now prevalent in this country. We know of few projects which are more in need of being carried on, and it is safe to say that there is nothing which would receive more hearty approval from practicing veterinarians than an investigation of this kind.

PLAN TO GO TO MONTREAL

Reports from Montreal would indicate that the members of the Committee on Local Arrangements are hard at work perfecting the details of the program for entertaining the Association next August. The tentative dates that have been selected for the meeting are: August 27, 28, 29, 30 and 31, 1923. We had hoped to be able to announce in this issue that these dates had been officially approved, but this has not been done at the time this editorial is being written.

A recent communication from Dr. J. H. Villeneuve, the very active Secretary of the Local Committee, called attention to the fact that our Convention is being held this year in a city where the Volstead Act is strictly "taboo". The Committee has already decided to have a banquet this year, a feature which has been missed at recent conventions, and that the banquet will be of the real, old-fashioned kind, "with its accompanying source of enjoyment." Dr Villeneuve states that the local

veterinarians will not be satisfied with anything less than a record attendance.

We might add further that the railroads will offer very attractive rates for the trip to Montreal. We hope to have the certificate plan in effect, but even though this may not be possible, the summer excursion rates offered by the various railroads will be very attractive. Our Association will be 60 years old this year, and we should not allow the event to pass without celebrating it in a fitting way. *Plan to go to Montreal!*

THE WINTER MEETINGS

In this number of the Journal will be found very good accounts of quite a number of the winter meetings of the various state associations and short courses held throughout the country. In almost every case the reports indicate that the attendance at these meetings was unusually good, Iowa leading with some four hundred members in attendance at Des Moines.

The fact is worth knowing that quite a number of these associations have decided to have, or are considering the advisability of having only one meeting a year. It has been found increasingly difficult during recent years to have two good meetings a year. Secretaries have found it difficult to arrange attractive programs and veterinarians have not found it possible to attend two meetings a year in many cases. We believe that it is better to have one good meeting rather than two poor meetings.

In this connection it is to be noted that the number of local and county veterinary organizations is apparently on the increase, and these local meetings in different parts of the state help to supplement the annual meeting of the State Association and render semi-annual meetings unnecessary to quite an extent. With most of the State associations holding one meeting a year, and this during the winter months, it is to be hoped that the attendance at the meetings of our National Association will be larger in the future. We heartily endorse the plan of one good meeting a year for our State associations.

THE ARMY VETERINARY CORPS

All of the older members are familiar with the strenuous efforts made by the A.V.M.A. to obtain an efficiently organized veterinary corps for the Army of the United States. The necessary

legislation has been obtained and we now have a small but well organized veterinary corps.

Congress has reduced the Army of the United States to a minimum so that there are now only 126 veterinary officers in the regular army. To provide for emergencies, an officers' reserve corps has been provided by Congress and organized by the Surgeon-General of the Army. Officers are commissioned in the Army of the United States and are assigned to duty where their abilities and training will be most useful in time of national emergency. Under this plan, the difficulties experienced by the veterinary Corps at the outbreak of the World War will be avoided.

At a meeting of the army veterinarians, both active and reserve, of the Sixth Corps Area, Major Christy, of the Cavalry, stated that there was great need for the veterinary reserve officers as there was a smaller percentage of veterinary reserve officers than in any other branch of the service.

Does this mean that veterinarians are less patriotic than other professions or than the average citizen? I do not think so, but it is up to our profession to make good as patriotic citizens and as veterinarians. It is a duty we owe to our country and to our profession. The A.V.M.A. has played an important part in securing an efficient army veterinary organization and now that our services are needed in this organization, let us "deliver the goods".

If you have not applied for a commission in the Veterinary Officers Reserve Corps, write to Col. J. A. McKinnon, Director Veterinary Corps, Surgeon-General's Office, Washington, D.C., and secure an application and full information — and then JOIN.

N. S. M.

THE RIGHT WAY

Dr. Laurence E. Green has sent us a card announcing his admission into partnership in the Monroe Jarrett Manufacturing Company, of Trumbauersville, Pa. He writes, "As you see by the enclosed, I have resigned from the veterinary profession, but I hope to keep in touch with the boys through your Journal. Kindly see that I receive the Journal regularly at my new address."

Dr. Green graduated from the University of Pennsylvania, Class of 1915.

FACTS RELATING TO INFECTIOUS ABORTION IN CATTLE AND SWINE; AND THEIR PRACTICAL APPLICATION[1]

By J. W. Connaway

University of Missouri, Columbia, Missouri

Scientific research is essential in developing unknown facts in the field of medicine; and critical discussion is often necessary to bring out the proper interpretation or correlation of the facts. But in the opinion of members who are more interested in the end-results of research, and their practical application, too much time has frequently been given in our programs to the *details* of technical research, and especially to acrid, disputatious discussions concerning abortion disease, which at the time yielded too little in results of immediate practical value to the busy practitioners, or to live stock sanitary officers, many of whom had come hundreds of miles for definite usable information, but too often returned home in a confused and discontented frame of mind regarding this question.

I am happy, therefore, to have this opportunity to attempt to show that research men are really practical men, and appreciative of the practical needs of their colleagues who deal daily with the more practical phases of the problem. A dozen others, whom it would be easy to name, could render this service as well or better than I; but this opportunity has come to me, and I hope I will not fail in presenting the essentials of the subject in a clear and acceptable manner.

In the control of any disease it is evident that the more complete our knowledge is of the nature of the disease, its cause, the modes of transmission, and the conditions necessary or favorable for its propagation, the more easily can effective measures of control be devised and applied. Infectious abortion in farm animals is no exception to the rule. However, there is no justification for withholding the practical relief that is now possible, even though certain phases of the problem are still in the experimental stage, and the last chapter relating to research has not been written.

It does not matter in what stage of progress our science at any time may be, the demands of the live stock breeders are

[1]Read at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., September 1, 1922.

that we use to the best of our ability, and in a safe manner, the essential facts that are available, be they few or many. And in my opinion, we have at the present time sufficient well established knowledge concerning the nature of abortion, particularly in cattle, to control this disease successfully. A review, therefore, of the facts which have a practical bearing, with suggestions as to the application of these facts, I believe will be of particular value to the veterinary practitioners, and to the live stock sanitary officers, at this time.

What facts of practical bearing have been established? The list which I shall give, I am confident will be accepted by the great majority of veterinarians and investigators, as having been proven, or at least as being supported by a sufficient weight of evidence to justify their tentative acceptance and use. And as this paper has been written for purely practical purposes, the list is presented as a statement of *useful facts*, without argument, and without burdening the paper, and your patience, with a confusing array of bibliographic evidence.

Important Facts Concerning Infectious Abortion in Cattle and Swine

1. The first important fact is that there actually exists a truly infectious disease, specific in nature, which causes the majority of abortions in cattle, and probably also in swine.

2. This infection is transmissible, under certain conditions, directly from an infected female to a healthy female, when kept in close association.

3. The infection is transmitted from the infected female to healthy animals through the uterine discharges, namely, the aborted fetus, the afterbirth, the subsequent lochial discharge; also by the milk.

4. An infected female which is sufficiently resistant to carry viable young to full term also discharges abortion infection at the time of parturition, on the coat of the live calf, in the afterbirth, and later in the lochial flow, and in the milk.

5. The infection remains alive outside the body of the infected animal for a considerable time, under favorable conditions; and the soiled tail and hair of the rump of the infected female, and the bedding, contaminated by the uterine discharges, may transmit the infection to healthy exposed animals.

6. The period of discharge of infection from the uterus is comparatively short—from three to six or eight weeks.

7. The disease is contracted under natural conditions by ingestion of infected materials.

8. Transmission by copulation is also possible, but probably not of frequent occurrence.

9. In the majority of cases, a *mature* infected female remains a permanent carrier of the Bang abortion infection during life, and is liable to abort at any pregnancy; and is a potential spreader of the disease at each parturition, and for a period thereafter.

10. Bulls occasionally become infected systemically, and the generative glands and passages may discharge abortion germs and infect females through copulation, or by the latter licking the soiled sheath of the bull, or the vulva of a cow which has been recently served by an infected bull.

11. The milk of abortion-infected cows is not liable to transmit infection to *mature* cattle—except from gross carelessness in handling the milk. The probabilities are not great that many sexually mature cows will have an opportunity to ingest sufficient infected milk to cause harm.

12. The danger of transmitting abortion infection from the milk of an infected cow through the fecal discharges of calves nursing infected mothers, has not been determined experimentally (Field observations of a few cases have shown no bad results).

13. Occasionally the young of an abortion-infected mother becomes permanently infected with the Bang abortion organism, *in utero*, or from the milk after parturition; as a rule, however, the young animal overcomes the infection before reaching sexual maturity and may be reared free from the Bang abortion disease.

14. Infected, non-pregnant cows, free from uterine discharge, do not transmit the abortion disease to healthy pregnant or non-pregnant cows.

15. Infected, pregnant cows do not transmit the Bang abortion infection to pregnant, non-infected cows before the period of parturition (or abortion).

16. Some infected cows develop a considerable degree of immunity or tolerance to the Bang abortion infection, and do not abort more than once or twice; while others may abort repeatedly.

17. The artificial inoculation of the living *B. abortus* germs in sexually mature females causes a permanent infection identical with the naturally acquired disease. The effects upon the animal are the same.

18. Healthy heifers and cows artificially infected before breeding are not so liable to abort as when infection occurs after breeding. Such inoculation, however, prior to breeding, causes abortion in some of the inoculated animals after they are bred; and any case so treated and infected permanently is liable to abort during a future pregnancy. And in all cases they are potential spreaders of abortion infection at time of parturition.

19. The *Bacillus abortus* (Bang) is the specific cause of the majority of cases of abortion in cattle and probably also in swine.

20. The serological tests—agglutination and complement fixation—are reliable, practical, diagnostic tests for detecting infected animals in a herd. The abortion test properly used is as accurate for its purpose as the tuberculin test is for detecting tuberculous animals.

21. Other organisms than the Bang bacillus occasionally cause cows to abort; as for instance, the tubercle bacillus may produce lesions in the uterus that result in the death and expulsion of the fetus; but this organism and the pus-formers which occasionally gain access to the uterus, do not have the selective, invasive properties that are possessed by the *B. abortus* (Bang), and which entitle the latter to hold the chief place as an abortifacient organism in cattle and swine.

Spirilla or vibrios have been found associated with abortion in cattle; but thus far there does not appear to be any indication that these organisms will prove a serious menace to cattle and swine breeding, as a specific or primary contagium transmissible from herd to herd through infected animals.

22. Sterility is at times a *sequel* of an abortion due to the Bang bacillus infection; but this sterility is probably the *result*, in most instances, of the post-invasion of the open uterus with pus-formers, and other wound infections, following a retained and neglected afterbirth.

23. Infectious abortion in swine, if not identical with that of cattle, is a closely related infection with strong evidence of intercommunicability.

Practical Measures of Prevention and Control

The facts summarized in the foregoing paragraphs supply the basis for measures of control which have been put in practice with success on a number of stock farms, and which it is

believed can be adapted to any condition that may arise. An outline of these measures is given herewith.

1. If an abortion occurs in the herd, isolate the animal promptly. Do not take the risk that the abortion was due to an accidental injury or shock, or to some non-specific infection.

2. Destroy the aborted fetus and afterbirth; burn, or bury them deeply, adding quick-lime before covering with earth.

3. Disinfect the stall and litter where the abortion occurred. Use compound cresol solution (U.S.P.), or other good disinfectant. If the abortion occurred in the open field, or cattle-yard, cover the spot with freshly slaked lime and sprinkle with a disinfectant which has a disagreeable odor, to prevent healthy cattle from licking up infected material.

4. Give attention to the quarantined cow. If the afterbirth has been retained, give proper treatment to prevent complications leading to chronic metritis, and other conditions that may result in temporary or permanent sterility. Day by day disinfect thoroughly the uterine discharges and contaminated bedding. Do not permit these to come in contact with healthy mature cattle and swine; and especially in contact with healthy pregnant females.

5. Keep the aborting cow in quarantine until uterine discharges have ceased. Before releasing from quarantine, spray the rump, tail and vulva with a disinfectant which has a sufficiently disagreeable odor to prevent healthy cows from licking the soiled parts.

6. While the cow is in quarantine, draw a blood sample and send it to the State Laboratory, or other properly equipped laboratory, where the diagnostic tests for abortion disease are made.

(a) If the first sample, drawn soon after the cow aborted, proves *negative* to the test, draw another sample in ten or fifteen days and have a retest made. (It occasionally happens that the blood-serum of a cow that has recently aborted does not contain sufficient reacting antibodies—in a free state—to give the specific reaction. If convenient, also send a sample of colostrum. This fluid contains the antibodies even when they are apparently absent from the blood of an infected cow or sow. The blood as a rule reacts strongly, both at time of parturition and at later periods. If therefore a negative reaction is reported on samples drawn on the fifteenth or thirtieth day, the proba-

bilities are that the cow is not infected with the Bang abortion disease.)

(b) If the blood sample, however, shows a *positive* reaction to the abortion test, proceed to test *all* the sexually mature breeding cows in the herd, as well as the mature bulls. There may be other infected animals in the herd that are not suspected, but which are carriers and distributors of abortion infection at an apparently normal calving; or, in the case of an infected bull with a diseased genital tract, a more continuous discharge of infection may be occurring.

7. After the test of the herd has been made:—(a) Mark or identify in some plain manner all the reacting individuals. (b) If convenient, separate all the reactors from the non-reactors, in different pastures and barns, to facilitate proper handling and observation, as well as to lessen the risk of spreading infection to the healthy animals. (c) Make a careful appraisement of the worth of the reactors as breeding animals, or as milk- and butter-producers. (d) Sell to the butcher all reactors that are not of special merit; such as old cows that have about reached the end of their usefulness, animals of defective conformation, poor milkers, unthrifty "hard-keepers," uncertain breeders, cows with bad udders, cows affected with persistent leucorrhoea, metritis or other genital ailment that has not yielded to expert treatment; and other reacting "boarders" in the herd, the disposal of which would lessen the leaks in the business.

The greater the number of reactors of the class mentioned that are sent promptly to the butcher, the better it will be for the owner of the herd—and for the industry. It will lessen the number of potential distributors of abortion infection to be kept under surveillance, and will hasten the day when the herd will be free from the disease. The ultimate elimination of all reactors is the end to be striven for.

8. Do not sacrifice abortion-infected animals of exceptional merit. They can be handled without great danger of spreading the disease. Some of them will abort more than once, and in widely separated pregnancies; and practically all will remain potential distributors of the infection; but many of them will become quite regular breeders, and their progeny, with but few exceptions, can be reared free from abortion disease. A careful watch, however, must be kept on all abortion infected pregnant cows, and if one should show signs of premature calving, she should be removed promptly from the herd into the quarantine

quarters, and handled as described in a preceding paragraph until safe to return to the herd.

All abortion reactors retained in the herd should be regarded as dangerous distributors of the infection *at calving time;* although the calving may appear to be in every way normal, and the calf fully developed and vigorous. Virulent infection has been demonstrated in the afterbirth of abortion reactors in such cases. (The same is true of abortion-infected sows which farrow living litters of pigs.)

To avoid danger from this source, separate the abortion reactor from the herd, several days before she is due to calve. Place the cow if possible in a calving-stable so constructed that it can be kept in proper sanitary condition. Isolated paddocks may be used if the drainage can be controlled.

When the cow has calved, dispose of the afterbirth and contaminated bedding in the manner already described. The vaginal tract and uterus should receive such treatment by the attending veterinarian as the circumstances may require. Disinfect the tail, and soiled hind-quarters, as often as seems necessary while the cow is in quarantine. Spray the infected stable litter daily with a disinfectant before cleaning the stall, so that infection may not be carried on the feet of the attendant to the stalls of susceptible cattle; and to prevent cattle from eating the contaminated bedding.

Disinfect the coat of the calf before transfer to quarters where the young animal may come in contact with mature susceptible cattle.

Keep the cow isolated from mature, non-infected cattle until free from infectious discharges—three to six or eight weeks. And when released from quarantine, sponge or spray the tail, vulva, and hind-quarters with an ill-smelling disinfectant to prevent other cattle from licking the parts mentioned.

The use of the spray on the hind-quarters is especially applicable in the handling of beef-bred cows which are reactors, and which have recently aborted or calved. The period of detention in quarantine may be lessened, if the infected cows are sprayed frequently after release from quarantine until the danger period is past.

In the case of milk cows, the use of an ill-smelling disinfectant applied as a spray is objectionable, on account of its contact with the teats and udder and the danger of tainting the milk;

but the application can be made more carefully by the use of a sponge, and the objections mentioned can thus be overcome.

9. The handling of the calves from abortion reactors is not a matter of much concern, *prior to sexual maturity,* so far as the transmission and the perpetuation of *B. abortus* infection in the herd are concerned. And no special changes in herd management are necessary during this period so far as the young calves are concerned. For, although the young of abortion-infected mothers are exposed to the danger of infection *in utero,* and subsequently from ingesting infected milk (for a period of several months in the case of beef-bred calves), the infection is nevertheless, in the great majority of cases, effectually overcome by the young animal before sexual maturity is reached.

The young heifer, on reaching breeding age should, however, be carefully protected from "open cases" of abortion carriers; namely, cows that have recently aborted, and abortion-reactors that have recently calved.

Both heifers and gilts when sexually mature are susceptible to permanent infection before breeding, as well as after becoming pregnant, although the susceptibility is probably greater during the pregnant state. Proper protection therefore should be given both before and after breeding to all sexually mature animals.

10. While the bull is not, as a rule, an important factor in the spread of abortion infection, it is preferable not to use an abortion-reactor; and no reacting bull should be allowed to run free with the herd.

If from necessity, or other valid reasons, a reacting bull is used, a special breeding pen should be provided to be used for this purpose only. The sheath of the bull should be flushed out a half-hour or more before service, and a canvas-bag muzzle should be placed over the mouth of the cow while in contact with the bull. Moreover, after service, the coat of the cow, and especially the rump, tail and vulva, should be sprayed or sponged with a coal-tar disinfectant. The cow should then be isolated a few days and sprayed again with the disinfectant before she is returned to the herd.

11. In the management of a herd of cattle or swine, a rigid rule should be adopted and adhered to by every breeder—requiring the temporary isolation of all sexually mature breed-

ing animals that are purchased; and the application of the serological abortion test before admission to the home herd. This also applies to nurse-cows that may be needed in show herds; and to cows and sows sent in from other herds to be bred. Clean herds of pure-bred cattle, and of swine, have become infected and suffered severe loss from these sources of infection.

12. A systematic testing and retesting of an abortion-infected herd should be carried out until the herd is free from the disease. All the young heifers should be tested after reaching breeding age, and especially after they have been bred a few weeks. The entire herd should be tested two or three times yearly, or oftener as circumstances may require. The drawing of the blood samples is such a simple matter, and the disturbance to the animal so slight, that these tests should not be neglected in valuable pure-bred herds.

13. The health certificate for inter-state shipment of sexually mature breeding cattle and swine should include an affidavit that the abortion test has been applied, and that the animal has been found negative to the test.

14. As vaccination against cattle and swine abortion with live *B. abortus* vaccine increases the number of permanent carriers and potential spreaders of abortion infection, its general and unofficial use should be prohibited. Its use should at least be surrounded by the strictest measures of governmental control.

15. In conclusion, I would emphasize the fact that the control of the Bang abortion disease is a comparatively simple matter; depending upon the proper application of a few essential measures; namely, the use of the diagnostic tests, with history of the cases, for the detection of the infection carriers, and the handling of these potential distributors of abortion infection in a manner to prevent sexually mature animals from ingesting the infectious discharges.

It is evident however that success cannot be attained in the control of this disease, unless the special though simple details of herd- and stable-management, which have been mentioned, are carried out in an intelligent and diligent manner. And while the burden of this work must be borne by the owners and the herdsmen who are in immediate charge, a special obligation rests upon the veterinary practitioners, and the veter-

inary sanitary officers, in the course of their professional work, *to give the men in immediate charge of a herd practical instructions in the details of what to do, how to do it, and when to do it.*

Discussion

Chairman Reed: Now, this interesting paper on one of the most important subjects we have to consider in the matter of veterinary medicine is open for discussion, and I hope we may have some very good discussion on it. Dr. Connaway, I know, will be glad to answer any questions that any of you have to ask in regard to his work.

Dr. Connaway: Before the paper is discussed, I wish to say that I hope the last two words just spoken by Dr. Reed will not mislead anyone into thinking that this paper is wholly my work; since the fact is that I have not hesitated to appropriate everything that was good from every available source, and endeavored to put it into practical form for the use of the members of the Section on Sanitary Science and Police.

Dr. W. E. Cotton (Washington, D. C.): Dr. Connaway has ably discussed this subject giving the known facts and their application. There are one or two points that he touched on which I would like to mention, and give a little of our experience at the Bethesda Experiment Station that bears on them.

Dr. Connaway stated that he believed there is not much danger of transmitting this disease from one cow to another through the milk. This is generally true, I believe, but there are exceptional cases where the milk may be dangerous to other cattle. It is the practice in some pure-bred herds to allow the calves to take milk until they are a year or a year and one-half old. When this is done, it may be that some of the calves will become infected, if the milk contains living abortion bacilli. We know that it is safe to allow calves to ingest milk infected with abortion bacilli for the first three or four months of their lives, but whether it is safe to continue this practice until they are a year or a year and one-half old, is a question that, so far as I know, has not been answered.

Dr. Connaway also spoke of the possibility of abortion bacilli passing out with the feces of calves. We did a little work on this problem some years ago at the Experiment Station. We fed calves cultures of *B. abortus* and made guinea-pig inoculations from the feces. Our results were negative, but as so many of the guinea-pigs died before lesions, due to abortion bacilli could have developed, the experiment was not conclusive.

To emphasize what Dr. Connaway has said about the infection of fields and pastures through abortions occurring in them, and the need of disposing of all infected material, I want to give the results of one of our experiments made to determine the length of time abortion bacilli remain alive in fetal and placental tissues when exposed to the weather. These tissues were exposed on the ground, under a wire screen, to prevent them from being carried away by animals, and it was found that during the colder months, the abortion bacilli remained alive in them for considerably more than 100 days. In the summer, they died in a much shorter time.

As to "carriers" that have never aborted, they are more dangerous than those that have aborted, because they are unsuspected. As to the danger through copulation, we, at the Bethesda Experiment Station, have not been able to transmit abortion disease through copulation, though we have tried repeatedly. We do recognize the danger, through the seminal fluid that is spilled, of contaminating food, but through direct copulation we have been unable to transmit the disease.

Of course, with hogs, the danger from food contamination is greater, because of the larger quantity of the seminal fluid discharged, and the habit of the hogs of eating from the ground.

As to the use of abortion vaccine, I would not go quite so far in my opposition as does Dr. Connaway, because, if you inject real, live, abortion bacilli into cattle at the proper time, something in the way of preventing abortions in infected herds will be accomplished. Unfortunately, abortion vaccines that are on the market are frequently dead or contaminated. The abortion

bacillus sometimes dies very quickly. We have had it die within 48 hours when suspended in physiological salt solution; and then again had it live for months under the same conditions, as nearly as we could determine them. Vaccination against abortion disease has not yet passed the experimental stage. At best, it can be only an expedient to reduce the number of abortions in infected herds. It cannot be used as an agent for eradicating the disease.

Dr. J. A. Kiernan (Washington, D. C.): Will you discuss the point of intercommunicability from cattle to hogs?

Dr. Connaway: Evidence in the way of reports from stockmen indicate that this has occurred; but we have no well checked proof that it occurs under natural conditions. Experimentally, however, we have produced abortion in pregnant sows by infecting them with the bovine strains of *B. abortus*.

Dr. Cotton: At the Bethesda Experiment Station, we fed a herd of twenty-five cows a small amount of culture of abortion bacilli isolated from swine, daily for about a month. There had been no abortion in this herd for a long time; it had acquired a strong herd-immunity. Inside of three months after feeding this culture three abortions occurred in the herd. We have not yet proved that these were caused by the abortion bacilli isolated from swine that had been fed, but the "lighting up" of abortion disease, where it had been so long quiescent following the feeding, indicates that there may have been some connection between the ingestion of the bacilli and the abortions.

Dr. E. B. Haskin (Indianapolis, Indiana): I would like to ask about the disease as it relates to swine. For instance, we will say that we have one hundred brood sows; sixty-five of them abort two or three weeks prior to farrowing time. What advice would you give the owner in such a condition, and what might we expect in the event that these sows were rebred?

Dr. Connaway: These are all pure-bred sows?

Dr. Haskins: About fifty per cent of them are.

Dr. Connaway: I would put in the pork-barrel all of those grade sows, to lessen the amount of infection to be dealt with, and to get closer to the pure-bred business; then I would select from the pure-bred bunch the best of the non-reactors as the foundation of a new herd. If, however, there were among the reactors or aborters, one or more of exceptional merit, I would isolate these from the others and breed them again, for many of the sows that have aborted will farrow a good litter of pigs the next time, and some of them may never abort again. But some may have only two or three live pigs, with maybe two or three dead pigs with hair on them, and perhaps a hairless mummy.

One of the drawbacks of this disease in swine is that, even if a complete abortion is not produced, a part of the litter may come dead; and in other sows only small litters are produced, and such sows are not profitable to the swine breeder. Moreover, some sows become permanently sterile after abortion.

In contrast with the conditions mentioned, we have in our experimental herd one infected sow that, so far as we know, has never aborted and is very prolific, having large and thrifty litters at each farrowing. We know this sow to be infected, since she is a reactor to the test, and *B. abortus* cultures were isolated from an afterbirth. Moreover, the young pigs were reactors after sucking the mother. We regard this sow as a probable spreader of abortion infection to susceptible animals, at her farrowing periods.

There is another thing that should be mentioned; we found that the younger stock, which as a rule lose the abortion reaction before sexual maturity, became reactors again if left with the older sows until they had attained sexual maturity; and this occurred in quite a number of cases in unbred gilts.

In a group of young boars, litter-mates of the gilts, which were separated from the mothers at weaning, the reaction remained negative until they were infected experimentally, or were exposed naturally, after they were sexually mature.

Chairman Reed: Gentlemen, Dr. Connaway made the remark that he had not done much work, but from his discussion I believe he hasn't been asleep all the time, and probably has some other things he could tell us if we would only ask him.

Dr. B. J. Killham (Lansing, Mich.): I have admired Dr. Connaway's

paper principally because of its practical nature, and there has occurred to me a question that is also confronting sanitary officials at this time and will become more difficult to answer as time goes on.

Dr. Connaway mentioned in his paper that for interstate shipment, cattle should be subjected to the "abortion test," and an affidavit furnished to accompany the shipment, indicating that the animals were free from the abortion disease. I would like to ask his opinion as to the practicability of requiring such at the present time for interstate and other movements of cattle.

DR. CONNAWAY: It is certainly very desirable, and I think more practicable than the tuberculin test. There is less disturbance to the herd in making the test, the task of the veterinary inspector is easier and requires less time. His duty would be to draw a small blood sample from each animal to be tested, identify the animals and samples officially and send the samples to the state laboratory. The report upon the abortion test can be secured quite as soon as that of the tuberculin test.

Some herds in our state, and no doubt in many states, have been badly infected through the purchase of one or two infected animals from other states. And, as a great many breeders regard abortion disease as an economic menace fully as great as tuberculosis, I am convinced that most of them are favorable to an official test for interstate traffic. Those who buy undoubtedly are.

CHAIRMAN REED: Is there any further discussion? Have you anything further, Dr. Connaway?

DR. CONNAWAY: Further discussion would perhaps only raise questions I can't answer.

CHAIRMAN REED: The subject is of such tremendous economic importance that we want to get all the information possible as live stock sanitary officials. When Dr. Connaway mentioned requiring a test for every breeding animal that was shipped, at least interstate, I felt what an ideal condition that would be if we could at this time demand such a test. It is not perhaps such a difficult matter in itself, but I fear it would be rather a difficult one to administer. Personally I would be glad to see something of that sort done, especially if it is going to lessen the amount of disease we have to combat.

Pardon the Chair for taking a little part in the discussion, but it is a subject of tremendous interest to me, as I have done some work in the field along these lines.

PRUDENCE

In Georgia they tell of a country minister, the Reverend Tyler Bliss, who was driving a spirited horse through a village, when he overtook a local physician, who happened to be on foot, and invited him in for a lift.

Ten minutes later the horse bolted, tipped over the carriage and spilled both men. The doctor rose to his feet and felt himself over to see whether he was injured. Then he turned angrily toward the clergyman.

"See here," he demanded. "What do you mean by inviting me to ride behind an animal like that?"

"Well," replied the minister mildly, "it was lucky that this time there were no bones broken. But I always like to have a doctor with me when I drive that horse."

The American Legion Weekly.

THE VALUE OF ANIMAL EXPERIMENTATION TO VETERINARY MEDICINE*

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The veterinary profession has advanced and prospered in direct ratio to the advancement and prosperity which has attended the development of the live stock industry. Conversely, the live stock industry always has been and always will be dependent for sucess on the ability of the veterinary profession to solve the problems of disease which have arisen and will continue to arise so long as domestic animals play a part in the scheme of existence. These statements are so obvious as to appear superfluous, yet they form the basis for consideration of still another factor, one which more than any other, has placed veterinary medicine in the position of "god-father" to the live stock industry. For it is believed that animal experimentation has enabled veterinary science to perform its greatest service to man and animals through the control and eradication of the infectious diseases to which our domestic animals are subject.

The history of greatest advancement in the control of disease is, for the most part, the history of experimental investigation. The day which sees the restrictions or prohibition of animal experimentation, as conducted by competent persons, will also mark the initial decadence of the medical professions in their chosen fields of service to man and animals. Yet it is safe to say that very few of those not actively engaged in investigational work as it applies to disease ever give much thought to animal experimentation in its various phases. Nine out of ten veterinarians today might say on casual consideration that it has little or no bearing on their work. However, a careful review of the subject reveals the fact that a surprisingly large part of our professional knowledge has resulted from such investigation, and that an equally large share of the veterinarian's equipment for the treatment of disease is dependent on the same factor.

The main attribute of success in any profession is a mastery of the fundamentals on which further knowledge must be based.

*Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

Anatomy, physiology, pathology and bacteriology, pharmacology and therapeutics are the essentials of the education of the veterinarian, without which the theory and practice of veterinary medicine and surgery would be nothing more than quackery. With the possible exception of anatomy, not one of these essentials would have emerged from the realms of guesswork without the employment of living animals in experimental work, and even in anatomy very painstaking research with living subjects has been necessary in order to determine many of the finer points of anatomic structure and relationship. As regards physiology, we still might believe, as did Aristotle, that "the heart is the seat of consciousness and will, and the brain an organ to cool the heart", had not Harvey and other pioneer physiologists pointed the way to certain knowledge by observations on animals. Pathology and bacteriology are so closely related to animal experimentation that any attempt to separate them would be foolhardy.

In pharmacology and therapeutics the relationship is just as close. Few drugs of any value have come down to us from the times before animal research was known and the actions of these were, as a general rule, only slightly understood. In the sixty-five years which have passed since the establishment of the first pharmacological laboratory more progress has been made in our knowledge of drugs than in all the centuries preceding.

Such statements are interesting as matters of history, but the average person is concerned chiefly with factors which have a more direct bearing on his everyday activities. In order to obtain accurate data concerning the effects of animal experimentation on the routine practice of the veterinarian today, a questionnaire was sent to the leading pharmaceutical and biologic houses of the country. Information was requested as to the extent to which the preparation or standardization of their products depended on animal experimentation. Commercial houses were consulted in this matter rather than those engaged in research because it was desired to obtain data concerning animal experimentation in its practical application to veterinary medicine rather than to dwell on the purely scientific phases of the work. Analysis of the answers received reveals some interesting facts. It is found that no less than fourteen species of animals are required either in the preparation or standardization of products commonly employed in veterinary practice.

Horses are employed for the production of tetanus antitoxin, anti-anthrax serum, anti-blackleg serum, antistreptococcic serum,

white scours serum, and antihemorrhagic septicemia serum.

Cattle, including calves, are used in the production of blackleg vaccine, aggressin and for anti-anthrax serum.

Sheep and goats are used as test animals for anthrax vaccine.

Swine furnish anti-hog cholera serum and hog cholera virus and are also used to test the potency of these products.

Dogs are essential in standardizing cannabis indica, epinephrin and ergot; they are also employed to prove the efficacy of antirabic vaccine.

Rabbits are the source of antirabic vaccine and are invaluable in testing various serums for potency and maintaining the virulence of bacterial cultures used in the preparation of vaccines and bacterins.

Guinea-pigs are the animals officially designated to test the potency of tetanus antitoxin and are universally employed to test the safety of various serums and bacterins. They are also used in the standardization of aconite.

White mice are commonly employed to maintain the virulence of bacterial cultures, roosters are employed to standardize ergot, frogs to standardize digitalis, and so on through the list.

In the production of pharmaceuticals, therefore, a considerable number, about 10 per cent, of drugs commonly employed in veterinary practice, are standardized on animals of various species. Among these drugs may be mentioned digitalis, squill, strophanthin, ergot, aconite, cannabis indica, epinephrin, pituitary solutions. By the use of animals in this work, the manufacturers are able to place in the hands of the practitioner products known to be active, the dose of which is accurately determined, and products so well standardized that practically no question arises as to the effects they will produce under given conditions. Few veterinarians would be willing to eliminate these drugs entirely, or accept preparations of them concerning the reliability of which they could know nothing.

The preparation of biologic products presents a much more striking example of what animal experimentation is doing for the veterinarian and the animals he is called on to treat. One hundred per cent of these therapeutic agents depend wholly or in part on animal inoculation and animal experimentation for production, tests of potency, tests of safety, and so forth. Hog cholera serum and virus, anti-anthrax serum and vaccine, blackleg vaccine, tuberculins and malleins head the list of biologic products without which the followers of veterinary medi-

cine could not long hope to maintain the record they have made in conserving the health of animals.

Again, in certain communicable diseases for which there is no specific treatment, animal research has made possible the development of measures whereby epidemics may be checked and foci of infection eradicated. The stupendous achievements in the campaigns of eradicating tuberculosis of cattle, tick fever glanders and other plagues have in one way or another been brought about by investigations carried on with living animals.

It may be argued that the prohibition of animal experimentation can have little effect on veterinary problems for the reason that much of the legislation aimed at restriction of this practice has for its chief object the exemption of the dog from experimental work. This is partly true and yet the forces opposed to animal experimentation are working to prohibit all animal experimentation so far as possible. Those familiar with the situation are entitled to question the advisability of allowing an entering wedge of any degree to be inserted beneath the foundation of further advancement in the medical sciences. If the opponents of animal experimentation succeed in prohibiting the use of the dog in research, then, to be consistent, they should and undoubtedly would bend their energies toward exempting other species or all species of animal life from this work. Once started, inconceivable havoc may be wrought by the unsympathetic intrusion of those who refuse to see the benefits obtained by observation on animals. Those who oppose the germ theory of disease and even go so far as to question the existence of such communicable diseases as rabies are scarcely fitted to dictate what shall be done and what shall not be done along the lines of experimental investigation.

For many years, the medical profession has carried the brunt of the fight which has been forced upon it by the pernicious activities of mistaken individuals who have assumed the role of animal lovers supreme. And yet the veterinary profession has just as much at stake as those who are primarily concerned with the public health. It is true that some of the leaders in our profession are taking part in the activities of those organizations whose purpose is to teach the public the value of animal experimentation. As a profession, however, we have been inclined to limit our activities to the passage of resolutions opposing legislation aimed at the restriction of such research.

Every veterinarian, in his daily contact with clients, can ac-

complish much by tactfully pointing out the relationship of the work which has made possible the development of agents, such as anti-hog cholera serum, for the control of infectious diseases. If the live stock owners of the country can be made to grasp the significance of animal experimentation as it applies to the health of their stock, a tremendous influence will be exerted in the interests of veterinary science and the advancement of medical knowledge generally.

In bespeaking the active interest of all veterinarians in the cause of animal experimentation, it is not asked that they relinquish in any degree their regard for animals. This profession, from its very nature, should have greater interest than any other group of persons in the welfare of all domestic animals. But we must be able to discern between what is best for the livestock industry with its millions of animals and what a few individuals would have us believe is best for the comparatively small number of animals used in research. The greatest good to the greatest number is a principle which can be applied to any situation.

Today there are just as difficult problems in veterinary medicine which require the assistance of animal experimentation to effect their solutions as have existed in the past. Much remains to be accomplished in abortion disease in cattle, foot and mouth disease, certain swine diseases, canine distemper, nutritional diseases, and a host of the more common ailments concerning which our knowledge is still rudimentary.

Briefly then, animal experimentation has furnished the basis for veterinary education; it plays a part in the production of 10 per cent of the drugs used in veterinary medicine; it is concerned with 100 per cent of veterinary biologic products. In the past all the veterinary profession has been able to accomplish in the control of infectious disease has been due to considerable extent to what animal experimentation has taught. Any future progress will depend quite as much on the same factor, and it is imperative that we do all in our power to prevent the weakening of that force.

Dog Language

Agitated Hotel Manager—"Say, don't you know that you shouldn't whistle in the lobby like that?"

Bell Boy—"Boss, I ain't whistlin'. I'se pagin' Missus Jones' dawg."

Life

GLANDULAR GROUP ANTAGONISM. ITS APPLICATION TO VETERINARY PRACTICE. PHYSIOLOGICAL STANDARDIZATION[1]

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In order to outline clearly the purpose of this paper, reference must be made to previous articles on the subject of glandular therapy and its relation to diseases of animals. The discussions and results of experimental investigations* are based upon a theoretical study of the physiologic activity of glandular life. The periods of glandular activity and the important endocrine glands which are related to the different periods are shown in Table 1.

Table 1—Periods of Glandular Activity

1. Youth	2. Sexual Maturity		3 Pregnancy	4. Suckling	5. Old Age
Thymus	*Male*	*Female*	Placenta	Mammary	Atrophy
Pituitary	Testes	Ovary	Corpus luteum	Ovaries	of all of
Thyroid	Adrenal	Adrenal	Mammary	Uterine mucosa	the glands
Adrenal	Thyroid	Thyroid	Foetus		of internal
Pineal	Pituitary	Pituitary	Uterine mucosa		secretion
	Prostate				

It has also been shown that a properly balanced mixture of extracts of the sexual maturity group is indicated for the treatment of failure to come in heat or "non-breeder," also for retained placenta and delayed parturition. Such preparations can be accurately standardized in the laboratory, by their specific abortive action on pregnant guinea-pigs.

Reference has been made to clinical data on the successful use of an experimental glandular extract mixture for the treatment of animals in which the signs of heat were not pronounced, and those which fail to breed. Attention has also been called to the successful clinical treatment of animals afflicted with nymphomania.

Glandular Group Antagonism

The present paper is limited to consideration of the two important glandular groups, namely, the female sexual maturity

[1]Read before the Missouri Valley Veterinary Association, St. Joseph, Mo., February 13, 1923.

*King and Shigley, Glandular therapy with special reference to animal experimentation. Veterinary Medicine, January 1923; Shigley and Meck, Endocrine therapy, North American Veterinarian, February, 1923; King, Glandular therapy in treatment of animal diseases, North American Veterinarian, January, 1923; Shigley, Organo-therapy, Veterinary Medicine, February, 1923.

group (No. 2, Table 1) and the pregnancy group (No. 3, Table 1). It is the purpose of this paper to report results which strengthen the theory, that the neutralizing or antagonistic action of one of the above glandular groups may be used to practical advantage in bringing the opposite glandular group into proper balance when same is over-stimulated or hyper-active. The results recorded in the earlier articles have shown experimentally that there exists a glandular group antagonism directed by the female sexual maturity group against the pregnancy group, as evidenced by the abortion of 80% of pregnant guinea-pigs after injection with synergistically balanced extracts of the sexual maturity group. This observation affords not only concrete evidence as to the existence of glandular group antagonism but, as already has been stated, it provides a means of physiologically standardizing a glandular extract mixture which is clearly indicated in the treatment of conditions in the breeding animals which are dependent upon a lowered tone, lack of balance and debility of the female sexual maturity group. Such conditions are: failure to come in heat or "non-breeder," retained placenta and delayed parturition.

Nymphomania—Clinical Results from Treatment with Pregnancy Group (No. 3)

Turning to the pregnancy glandular group which consists of placenta, corpus luteum, mammary, fetus and uterine mucosa, the theory has been advanced that a synergistically balanced mixture of these glandular extracts is clearly indicated in the treatment of nymphomania. This is theoretically true because of the fact that in nymphomaniacs the sexual maturity group of endocrinous glands (ovary, adrenal, thyroid and pituitary) are over-stimulated, or are subject to hyper-activity, while the glands of the pregnancy group (corpus luteum, mammary and uterine mucosa) are lacking in proper tone or are debilitated. In such cases, the animals should be treated with repeated injections of a properly balanced mixture of the pregnancy group extracts. In support of this the results are submitted (Table 2) following the treatment of seven grade cattle which were chronic nymphomaniacs.

Detailed Discussion—Nymphomania Case Reports

These animals were all registered Holstein cattle, kept in the usual well-arranged, modern barn and provided with bal-

TABLE 2—TREATMENT WITH PREGNANCY GROUP NO. 14

No.	Age	Record of Calves and Abortion	Heat Periods	Period of Nymphomania	Condition before Treatment	Period of Treatment	Result
1	5	3 calves (1 abortion)	Daily	About one year	Loss of flesh.	14 days (5cc); 25 days (10cc).	Increase in butter-fat and flesh. Heat period—2 weeks.
2	5	"	2-3 days	"	Broad ligaments relaxed.	"	Same. Heat—20 days.
3	9	"	2-3 times per week	6 months		"	As above. Heat—14 days.
4	4	2 calves		8 "	Sagging back.	14 days (5cc).	Improvement. Were sold.
5	5	"		8 "			
6	4	1 calf	2-3 days	10 "			
7	12	Number of calves not determined. Retained placenta. Vaginal discharge.	Daily	More than one year.		2 weeks (5cc). Increased to 10cc. (2 weeks)	Marked improvement. Developed abscess in 1 ovary, sterile

anced rations fed according to approved methods. Special attention was paid to milk records and butter-fat production and less to the breeding condition of these animals. As nymphomania became evident the veterinarian's attention was called to the condition, and repeated examinations, with rupture of cysts, failed to bring about any marked improvement. It was then decided to use a balanced mixture of extracts of the pregnancy glandular group in an attempt to restore the normal activity of the parts affected.

Cow No. 1 had given birth to 3 calves, one of which was an abortion. This animal was fed for milk production and developed chronic nymphomania. This was accompanied by loss of flesh, changes in broad ligaments, sagging back and a consequent decrease both in the amount of milk and the butter-fat content. experimental lot No. 14 of the pregnancy glandular group was injected in 5-cc doses daily for about two weeks, when the herdsman allowed the animal to go for a short period without injections. When injections were resumed 10 cc daily were given with marked improvement in the physical condition of the animal, increased butter-fat, and an improvement of ovarian tissue, with a decrease in formation of cysts. The frequency of the heat periods rapidly subsided and at the time the above record was made the minimum period was at 14-day intervals.

Cow No. 2 has a record very similar to Cow No. 1, with the exception that heat periods were at 2- to 3-day intervals. Im-

provement was marked following the use of the extracts of the pregnancy glandular group as the heat periods were at twenty-day intervals which is approaching a normal condition.

Cow No. 3 showed extensive physical changes, with sagging back, base of tail prominent, broad ligaments sunken. Heat periods occurred 2 or 3 times per week with the usual effect on milk-production. Ovaries were cystic and body of uterus showed lack of tone. The use of extracts of the pregnancy group was indicated and the improvement was very noticeable. The ovaries showed a rapid approach to normal consistency, with less tendency to cyst development. The uterus had a better tone and the heat periods were at approximately fourteen-day intervals.

Cows Nos. 4, 5 and 6 were younger than the others and showed fewer external physical characteristics than the others. When treated, these animals showed improvement and were sold with a group of others from the same herd. It would seem that these animals were sufficiently changed in habits so that the purchaser would not recognize that chronic, nymphomaniac conditions had existed.

Cow No. 7, aged, number of calves not determined. This animal had a history of retained placenta, at last calving, and a vaginal discharge which was not controlled with the use of local applications. Nymphomania had been evident for over a year and hence the case presented was not very favorable. The use of experimental lot No. 14 resulted in an increase in general tone as well as in the tone of the uterus and ovaries. However, this animal developed an abcess in one ovary and the owner desired to dispose of her.

In all of the above cases the animals were subjected to regular examinations and cysts were ruptured as they were detected. It is well to bear in mind that all of these cases were of long standing and most of them had been considered hopelessly chronic, beyond any form of control or treatment. The results clearly show that repeated injections of synergistically balanced extracts of the pregnancy group, experimental lot No. 14, effected a material change in regulating the heat periods, in controlling the behavior of the animals, and in influencing the production of butter-fat.

Physiologic Action, Pregnancy Group (No. 3)

Among other laboratory experiments, concerned especially with the experimental testing of the activities of various glandular mixtures, considerable attention has been given to the development of a physiologic test of a synergistically balanced mixture of the extracts of the pregnancy glandular group (placenta, corpus luteum, mammary, fetus and uterine mucosa). It has been found that the potency or activity of such a product may be determined by the use of normal virgin guinea-pigs which have attained the breeding age. Such animals, as they are found in good, healthy breeding-stock are represented for the most part by young females, in which the sexual maturity group of endocrinous glands are active, due to rapid maturity and in many cases are over-stimulated.

It is, of course, well known that the guinea-pig represents an animal which is a prolific breeder and in which the period of gestation is relatively short (seven weeks). Those who are familiar with the breeding of guinea pigs, especially on a large scale, often observe that in a lot of virgin females, of approximately the same age or same period of sexual maturity, conception will occur at various times. This is in all probability due to an absence of proper balance between the sexual maturity and pregnancy groups of glands. The rapid development of the sexual maturity group of glands causes an over-stimulation of that group and a consequent delay before the sexual maturity group regains a normal degree of activity and allows the pregnancy group to attain full activity. With these observations in mind, a series of experiments were conducted in sixteen virgin guinea-pigs, a summary of which is found in Table 3.

The above series of guinea-pigs were known to have been virgins, and had had no opportunity to become pregnant, as male animals had not had access to them before the experiment was undertaken. As the period of gestation of a guinea-pig is seven weeks the experiment was conducted for that length of time. Eight of the animals were treated with 1 cc of synergistically balanced mixture of extracts of the pregnancy group, experimental lot No. 14, the subcutaneous injection being given at 48-hour intervals. Three of the control animals were given 1 cc of protein solution, which represented the same amount of protein material obtained from the tissue extracts as that contained in the glandular extract mixture. Five of the control

TABLE 3—EXPERIMENT TO DETERMINE EFFECTS OF A MIXTURE OF THE EXTRACTS OF THE PREGNANCY GLANDULAR GROUP

Pig No.	Weight gms.	Period of Treatment	Treatment	Distribution and Number of feti	Total wgt. of feti per pregnant pig
1050	400	48 days	1cc. Lot 14 Every other day	Right horn 2	12.5 gms.
1059	410	"	"	Both horns 2	8.9 gms.
1060	448	"	"	" 3	30.0 gms.
1061	420	"	"	" 3	14.60 gms.
1062	420	"	"	" 3	29.60 gms.
1063	390	"	"	Right horn 2	3.80 gms.
1064	410	"	"	Both horns 3	Too small to weigh
1056	360	"	"	" 3	20.00 gms.
1065	330	"	1cc. protein solution	Non-pregnant	
1067	450	"	"	"	
1069	450	"	"	Left horn 3	32.30 gms.
1070	380	"	Control	Right horn 1	Too small to weigh
1071	350	"	"	Non-pregnant	
1072	350	"	"	"	
1073	315	"	"	Left horn 1	4.80 gms.
1074	380	"	"	Right horn 1	3.10 gms.

animals received no treatment whatever. The results of this experiment are summarized in Table 4.

TABLE 4—SUMMARY OF RESULTS OF EXPERIMENT WITH PREGNANCY GLANDULAR GROUP

Eight Virgin Females treated with Mixture of Extracts of Pregnancy Group No. 14		Eight Virgin Females three treated with Protein Extracts. Five untreated.
100%	Percentage Pregnancies	50%
21	Number of feti	6
118.5 gms.	Weight of feti	40.1 gms.
14.8 gms.	Average weight of feti per mother	5.0 gms.
75%	Both horns of uterus pregnant	0
250%	Percentage increase, feti over controls, by number	
188.3%	Percentage increase, feti over controls, by weight	

A concrete idea of the results secured in the above experiments may be obtained by a glance at photograph (Figure 1), of the feti dissected from the uteri of both treated and untreated pigs. Five of the treated virgins produced three feti each. Usually primipara give birth to only one or two pigs.

The clear-cut, distinctly positive results of the above experiment, in addition to furnishing good evidence that a properly balanced mixture of the extracts of the glands of the pregnancy

group may be tested in the laboratory, also clearly demonstrate the practical application of the use of balanced extracts of the pregnancy group of endocrinous glands in clinical work. It is clearly shown that such a preparation exerts a distinctly antagonistic action toward the female sexual maturity group of glands. This conclusion is borne out by the result of clinical work upon cattle which are subject to chronic nymphomania. The use of a balanced mixture of the extracts of the pregnancy group exerts a markedly beneficial action in antagonizing or neutralizing the over-stimulated female sexual maturity group.

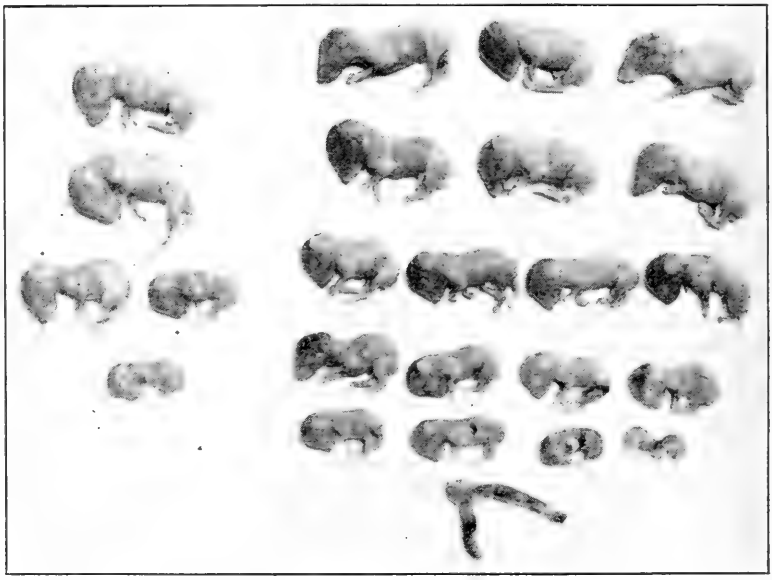


FIG. 1. Feti on left are those from control pigs. Those on right from treated pigs. One fetus omitted from group on left, being too small to be dissected from uterus. Uterus at bottom of group on right contains three feti too small for dissection.

Practical Application of the Glandular Antagonism of Pregnancy Group

Furthermore, in the light of this experiment it seems probable that non-breeding animals, with the exception of those which are subject to specific infection or surgical disorders, may be divided into two classes: first, those which fail to come in heat; second, those which come in heat, but which fail to conceive. Those animals included in the first class, which fail to come in heat, represent an improper glandular group relationship, in

that the pregnancy group predominates, thus holding in check the female sexual maturity group. Such cases show material results following the use of a properly balanced mixture of the extracts of the female sexual maturity group. Secondly, those animals which come in heat, but which persist in failure to conceive, illustrate the predominance of the pregnancy group over the sexual maturity group. It seems evident that in such cases the relationship of the two groups is such that the activity of the sexual maturity group is overneutralized by the hyper-activity of the pregnancy group. It follows, therefore, that in such cases a properly balanced mixture of extracts of the pregnancy group should be administered for the purpose of stimulating the pregnancy group and antagonizing the hyper-activity of the sexual maturity group.

Practical Application of the Glandular Antagonism of Sexual Maturity Group

As illustrating further the practical application of glandular group antagonism in the treatment of certain animal diseases reference may be made to the results of experiments reported in previous articles. It was found that the administration of a properly balanced mixture of extracts of the female maturity group, to pregnant guinea-pigs, exerted a specific abortive or oxytocic action in 80% of the treated animals. Aside from the scientific application of these results in the standardization of such a glandular extract mixture, which is indicated for the treatment of animals which fail to come in heat, and in which the sexual maturity group of glands is not normally active, they are of practical importance from the point of view of the application of glandular group antagonism. Not infrequently abortions are desired in pure-bred animals. This is especially true in the case of pure-bred cattle, which have been inadvertently served by a scrub bull. It often happens that a valuable bitch is bred by a mongrel or the value of a registered filly is impaired because of accidental service by a grade stallion. In such cases a synergistically balanced mixture of the extracts of the sexual maturity group of glands, in repeated doses subcutaneously, should be given to produce the desired abortion. This follows along the line of a physiologic process unattended by loss of flesh and debility, which are commonly experienced after the use of various drugs employed for this purpose.

Summary

1. The basis for the experimental work outlined depends upon the grouping of the various endocrine glands in their relation to the different periods of life, as follows: (1) Youth (thymus, thyroid, adrenal, pineal); (2) Sexual Maturity (ovaries, adrenal, thyroid and pituitary for the female, and testes, adrenal, thyroid, pituitary and prostate for the male); (3) Pregnancy (placenta, corpus luteum, mammary, fetus and uterine mucosa); (4) Lactation (mammary, ovaries, uterine mucosa).

2. A synergistically balanced mixture of extracts of lot No. 14 showed markedly beneficial action in the treatment of a series of seven cows which were chronic nymphomaniacs. The heat periods were reduced from approximately daily to two or three times a week, to fourteen- to twenty-day intervals. The butterfat was increased, as well as the general condition and the habits of the animal.

3. A series of sixteen virgin female guinea-pigs were removed from the pens in which no males had had access and placed with breeding males. Eight of these pigs were given subcutaneously, at forty-eight-hour intervals, a properly balanced mixture of extracts of the pregnancy group. Eight of the pigs were retained as controls, three of these being given subcutaneously, at forty-eight hour-intervals, 1-cc doses of protein extract solution. At the end of forty-nine days all animals in the series were killed and autopsied. 100% of the treated animals were pregnant, while only 50% of the controls were pregnant. The treated animals as compared with controls showed the following results: 21 feti as against 6; 118.5 gms of feti, as against 40.1 gms; 14.8 gms. of feti per mother as against 5 gms.; both horns of the uteri pregnant in 75%, as against none. The percentage of increase of feti in the treated animals, by number, was 250% and by weight, 188.3%.

4. The results of these experiments show that a properly balanced mixture of the extracts of the glands of the pregnancy group exerts an antagonistic action, or a neutralizing effect, upon the secretions of a hyper-active female sexual maturity group.

5. The results of guinea-pig experiments tend to indicate that non-breeding animals may be divided into two classes. First, those which fail to come in heat, due to lowered activity of the sexual maturity group of endocrinous glands, and second, those which do not conceive although they come in heat, due to a

predominance of the activity of the pregnancy group over the sexual maturity group of endocrinous glands.

6. Further illustrations of the practical significance of glandular group antagonism in the treatment of animal diseases is afforded by the action of properly balanced extracts of the glands of the female sexual maturity group, in exerting a specific abortive action in 80% of treated guinea-pigs. This might be applied, in the field, in the case of pure-bred heifers, or other valuable animals which have been inadvertently bred to undersirable sires.

7. The results of experimental work indicate that the proper application of glandular group antagonism, if directed in a careful manner, depending upon properly diagnosed conditions, should yield specific beneficial clinical results.

ENGLAND'S FIRST WOMAN VETERINARIAN

England's first woman veterinarian has distinguished family connections. She is Miss Aleen Cust, daughter of the late Sir Leopold Cust and a sister of Sir Charles Cust, Equerry to King George. Miss Cust told the story of how she became the first woman to enter upon the practice of veterinary surgery with the approval of the Royal College. Appropriately enough, she lives in a mews back of fashionable Eaton Sq., and as animals are her hobby in life, she is literally surrounded by highly bred dogs.

"It has taken me 18 years to get the diploma," she told your correspondent, "although a long time ago I passed through the four years' course at the Edinburgh Veterinary College, gaining medals and prizes in open competition. At that time the Royal College would not open its doors to women.

Miss Cust, among other activities, served during the World War in a bacteriological laboratory attached to a veterinary hospital in France. For 10 years she was veterinary inspector under the Galway County Council and the Department of Agriculture in Ireland, but had to leave when conditions became unsettled across the channel."

Brooklyn Daily Eagle

Dr. T. E. Munce, of Harrisburg, Pa., addressed the December meeting of the Pennsylvania Tuberculosis Society on "The Relation of Animal Tuberculosis to Public Health."

OBSTETRICS IN SMALL ANIMALS*

By William J. Lentz, V. M. D.

School of Veterinary Medicine, University of Pennsylvania.

In this paper I have confined myself to narrow limits, as the title, "Obstetrics in Small Animals", is entirely too comprehensive for one paper.

ESTRUM OR SEASON.—This in the bitch is an irregular function, usually twice each year; sometimes but once, in others oftener; duration from ten to twenty days. The consensus of opinion among breeders is that when copulation occurs late in the estral period, there will be a preponderance of males. Recent scientific investigations, however, prove that there is no foundation for this belief. Furthermore, they believe that a successful service is one which has taken place late.

Bitches in estrum should not be exposed to damp and cold or bathed unnecessarily. Congestion and enlargement of the lobes of the thyroid, bringing about difficult respiration, is not uncommon during estrum.

BREEDING OR MATING.—The sexes should be nearly equal size, so as not to produce offspring to which the female is unable to give birth. Like begets like, but it should also be borne in mind that the sire and bitch are in a sense only intermediaries through which the characteristics of the grandparents are transmitted.

Breeders are generally of the opinion that the bitch will retain a mental impression of the dog with which she has been mated. There is absolutely nothing in this. They keep the bitch isolated after a service, not only because of this idea, but also to guard against the danger of a second conception with an undesirable male. Several instances of superfetation have been brought to my attention, that is, a bitch may copulate several times during an estral period, with an interim of several days or more, thus accounting for different periods at which the progeny sometimes appears. One or two days is not at all uncommon between the puppings; in one case even ten days. The puppies may even be of different breeds.

Opinions differ as to the number of "visits" necessary to in-

*Presented at the annual meeting of the Pennsylvania State Veterinary Medical Association, at Harrisburg, Pa., January 23 and 24, 1923.

sure pregnancy. This, however, depends largely upon the duration of the connection. It should be at least ten to fifteen minutes. The second "visit" should not be too long delayed so that the interval between the birth of the puppies is short. Because of the possibility of superfetation in the bitch, the interval between matings should not be more than twenty-four to forty-eight hours, and in delivering an animal, one should elicit a history as to the number of copulations, and the duration of time between.

DIAGNOSIS OF PREGNANCY.—This may frequently be determined by palpation of the uterus after the third or fourth week. This may of course be facilitated by first fasting the animal and then placing her on her side or back. Later, a fairly accurate diagnosis can be made by the use of the X-ray. The vertebral columns of the foetuses will be shown on the skiograph at a comparatively early period. Swelling of the mammae and the presence of milk in the teats are not necessarily a sign of approaching parturition, as this condition is frequently in evidence in estrum.

PARTURITION.—The duration of pregnancy is from sixty-two (62) to sixty-four (64) days. In our parturition cases in the bitch, we are frequently confronted with the question as to when to render aid. We should not be too hasty in making a display of our skill as obstetricians, as the time occupied in giving birth to a puppy is often of long duration, and the interim between births is often very long; this undoubtedly is a wise provision of nature to guard against prostration of the mother.

It is always advisable to make an examination *per vaginam*. If a puppy is felt through a sack of membranes, so to speak, that is, if the water-bags are not broken, one should, as a general rule, refrain from interference at this time. If, on the other hand, the finger comes in direct contact with the hair-coat of the puppy, and it is not in the pelvic inlet, then aid should be given.

The most frequent causes of dystokia are malpositions of the foetus, a too small or deformed pelvis, uterine inertia, etc. The first labor pains are short and somewhat weak, but as labor proceeds they should become stronger, longer and more frequent, and the supplementary respiratory and abdominal muscles should be active.

Uterine inertia calls for the administration of pituitrin, ergot or quinine, and in this connection it should be borne in mind that

in some bitches with pendant bellies, the foetuses have to ascend a step, so to speak, to reach the pelvic inlet. Therefore it is advisable in some cases to hold up the abdomen of the bitch when she is laboring. In dry labor and in malposition of the foetus, I have found a vaginal and uterine douche of warm flaxseed tea, soap suds or therapogen solution of marked value, when it becomes necessary to employ instruments, because we can thus balloon the vagina and uterus and we are less apt to pick up or injure the walls of these organs; besides, we can frequently move the foetus about. In dry labor, it is sometimes advisable to place the animal in a warm bath, meanwhile keeping the finger in the vagina until relaxation ensues.

Ergot seems of marked value to produce uterine contractions in the bitch. If the labor is protracted and the pains are weak it is indicated.

Various instruments are employed for the extraction of puppies and there are several different patterns of forceps. The most necessary and essential feature of any forceps is that the blades must be long enough to grasp as much of the foetus as possible.

One of the simplest, and at the same time one of the most effective, instruments for the extraction of puppies is a piece of copper wire about one foot and a half in length and a canula. The wire is doubled and passed through the canula so as to form a loop at one end. The index finger of the left hand carries the loop into the vagina and holds it in place on the poll of the puppy. The end of the canula is now pushed forward beneath the chin and an assistant then puts traction on the wire. Another very effective instrument is simply a blunt hook made from a piece of stout wire about a foot long, exercising care to keep the finger on the hook after its fixation. Sometimes, by placing the hook into the intermaxillary space live puppies may be extracted. When the puppy is dead it may literally be raked out with such an instrument.

CESAREAN SECTION.—We prefer the median-line operation and do not consider it a hindrance to the proper suckling of the young. The question as to whether or not a uterus should be extirpated is dependent entirely upon the viability of the organ. If the uterus has a grayish, purplish or greenish color, is flaccid and involution does not appear to have taken place, then it should be removed. A viable healthy uterus should involute under one's eyes, so to speak, after the puppies are removed, and

one can often draw conclusions in this respect on noticing how freely the uterus bleeds when the incision or incisions made in it are stitched up. A healthy uterus bleeds somewhat freely when stitched. Preparatory to stitching, the cavity of the uterus should be flushed with a normal saline solution. The application of warm saline solution packs or the electric current, or lightly painting over the organ with Lugol's solution, will sometimes overcome the flaccidity and cause the organ to involute. As far as our experience enables us to speak, we are inclined to believe that the animal is more likely to survive an extirpation of the uterus, if the ovaries are not removed.

Besides puerperal sepsis and shock, a very common cause of death is hemorrhage from the uterus, which is made manifest by the blanched appearance of the visible mucous membranes. To guard against this, preparatory to and following the operation, we give hypodermically 10 to 30 cc of normal horse serum and in addition, ergot and atropine. Numerous reports by medical obstetricians call attention to the value of normal human, horse or rabbit serum in uterine hemorrhage and in eclampsia.

PUERPERAL SEPSIS or infection along the genital tract after labor, is sometimes a very intractable condition to treat, because of the long bicornuate uterus in the bitch. If complete or partial involution has occurred, and the contraction of the *cervix uteri* has been active, we find it almost a physical impossibility to treat the uterine mucosa by irrigation. Inasmuch as about ninety per cent of the infections of the genital canal are due to streptococci, antistreptococcic serum seems to be indicated. When recourse to instruments has been found necessary, irrigation with the following solution, by gravity, immediately after delivery and before the uterus involutes, will often prevent infection: formalin 20 minims, glycerine 4 ounces, and 1 pint of one per cent Lugol's solution. After injection, gentle pressure on the abdomen facilitates the removal of the solution.

If the temperature following labor is elevated for several successive days, one must assume either that general systemic infection has occurred or that an inflammatory action has begun along the tract, anywhere from the vulva to the ovaries. In general infection, we must support the body cells in the combat which they must wage with the invading micro-organisms. Occasionally, septic peritonitis is a complication, which is indicated by pain and rigidity of abdominal muscles on palpation, vomit-

ing, fever, etc. Sometimes as a sequel, we have bladder infection due to injury of the wall resulting from pressure and stretching, thus diminishing the vitality of the cells of the mucous membrane; and they are thus not in a condition to resist the attacks of micro-organisms which may have gained entrance to the bladder. This is made manifest by frequent micturition, pain on pressure, fever, pus in urine, etc. We have frequently found that Epsom salts, belladonna and sweet spirits of nitre, in rather large doses, reduce the temperature from 104 and over, to the normal in 24 hours.

Infection of the teats and a subsequent mammary inflammation or suppuration is sometimes prone to occur after parturition. Cleanliness, emptying of the glands by milking, and support by wide bandage are beneficial. Prevent suppuration by drawing the blood from the mammae by an active purge. Fomentations of very hot water and packs of lead water and laudanum frequently renewed are measures of value.

SUB-INVOLUTION.—An arrested or retarded return of the uterus to its normal condition and dimension after labor is of common occurrence. The most frequent cause is the retention of placentae, wholly or in part. Sometimes, of course, it is due to a passive congestion or hyperemia of the organ. Douching with a solution of therapogen, normal saline, soapy water or mineral oil, is indicated, as well as ergot or large doses of quinine by the mouth.

ECLAMPSIA.—The indications for treatment in convulsive seizures of this nature are: first, to diminish nervous sensibility and lessen muscular power, in order to reduce the convulsions in violence and frequency; and second, to eliminate the poison from the blood as quickly as possible. The first indication is met by an anesthetic such as ether or chloroform and the use of hypodermics of morphine sulphate. The second by an active purge, normal saline, enemas, hypodermic injections of normal saline solution and arecolin.

Dr. Louis A. Klein, of the University of Pennsylvania, regarded as one of our foremost authorities on diseases of the udder, delivered addresses on the subject of "Mastitis" before the Schuylkill Valley Veterinary Club, at Reading, Pa., in December, and the Northeastern Veterinary Club, Wilkes Barre, Pa., in January.

INTERESTING CASES OF TUBERCULOSIS WITH LESIONS IN THE SUBCUTANEOUS TISSUE AND EPIDIDYMES[1]

By Fred Boerner, Jr. and V. G. Kimball

Philadelphia, Pa.

In July, 1922, one of us (V.G.K.) was called to examine a valuable Guernsey bull, which, according to the herdsman, showed some lumps in the skin over the cervical, thoracic and ischial regions. An examination revealed nodules arranged more or less in chains and about the size of walnuts. They were freely movable beneath the skin, firm, solid and painless. From the

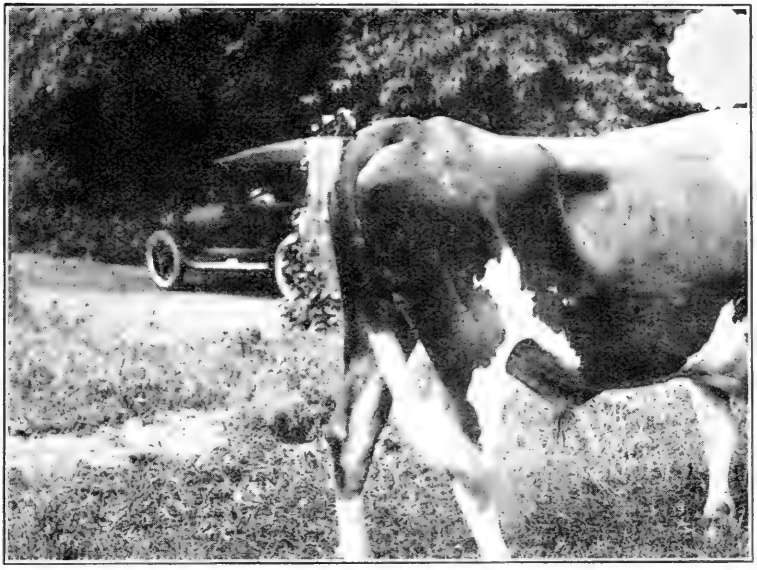


Fig. 1. Shows location of subcutaneous nodules

ischial tuberosity to the hock, there were about fifteen or more of various sizes. Nodules were distinctly visible in the neck of the scrotum and on palpation the epididymes were found to be greatly thickened. There were several small nodules along the under side of the tail and a few over the ribs.

The history revealed that the nodules were first noticed about

[1]Contribution from the Pennsylvania Bureau of Animal Industry and Veterinary School University of Pennsylvania. This paper was presented at the meeting of the Pathological Society of Philadelphia, December 14, 1922.

two months before, at that time being very small but growing rapidly. The patient was in good flesh but according to the herdsman was becoming slow in service. Since the herd (numbering several hundred) had recently passed a satisfactory tuberculin test, the diagnosis of tuberculosis was at that time excluded. The patient was negative to an ophthalmic and subcutaneous test in November, 1921.

On July 17th one of the tumors in the ischial region was excised for laboratory examination. A diagnosis of tuberculosis was made, based upon histologic examination. An ophthalmic and intradermal test was then applied with negative results. The patient began to lose flesh and had difficulty in rising. A stenotic

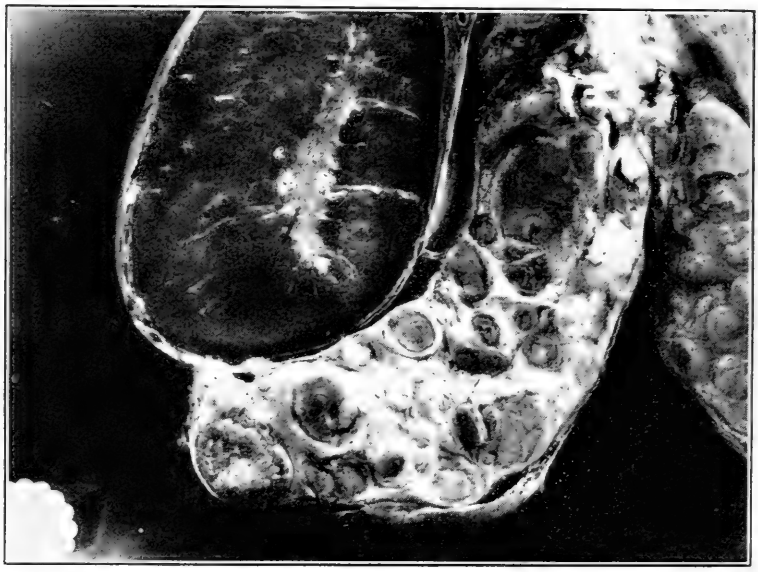


Fig. 2. Shows lesions found in epididymes

respiratory noise developed about the middle of August. The dyspnoea became quite marked upon the slightest exertion. It was finally decided to slaughter the animal.

On August 11th the bull was killed. A necropsy was performed and the following pathologic changes noted. The nodules previously described in the ante-mortem examination were found to be located in the subcutaneous tissue and in a few instances in the fascia between the muscles. Most of them were spherical, but a few, particularly those on the tail, were elongated. They

varied in size from a pea to a walnut and were either isolated, in clusters, or in chains, apparently following the lymphatics. They were for the most part confined to the hind quarters. A few nodules were found on the flank.

On section these nodules all presented the same general appearance, having a necrotic center which was rather firm with beginning caseation. Upon close inspection the necrotic center appeared somewhat laminated and surrounded by a distinct capsule which was rather thick. Similar tumor-like nodules were present in the genital organs. Both epididymes were converted into a mass of nodules identical with those just described. Between the nodules there was considerable induration. Both testicles were apparently free of any lesions. In the postpharyngeal region an abscess the size of two fists was found which contained a large quantity of flocculent pus. The wall was about one-half inch in thickness and on section showed minute areas of calcification. A portion of this abscess was directly pressing upon the larynx and superior end of the trachea. The superior cervical and retropharyngeal lymph-glands on both sides were greatly enlarged and caseous. A caseous lesion the size of a half-dollar was found in the anterior mediastinal lymph-gland. Several miliary lesions were found in the lungs. The liver contained a caseous lesion the size of a dime.

Smears made from these lesions failed to reveal acid-fast bacilli. However, a histologic examination of the lesions showed typical tuberculous inflammation in every instance. Guinea-pigs were inoculated as follows: Two with pus from retropharyngeal abscess, two with emulsion of mediastinal lymph-gland and two with an emulsion of the nodules from the subcutaneous tissue. All of these animals developed generalized tuberculosis except those inoculated with material from the subcutaneous nodules. Even though we were unable to demonstrate tubercle bacilli in these nodules the histology was typical of this disease. This, together with the fact that extensive tuberculous lesions existed elsewhere, justified our considering them as tuberculous.

Discussion

Tuberculous epididymitis appears to be very rare in animals. This case shows very extensive lesions of both epididymes without involvement of the testicles. This is in accord with obser-

vations in human medicine that "Extension to the testicle may occur, but is unusual".

The central necrotic mass of the nodules found in the subcutis and epididymes was large in proportion to the capsule and well circumscribed. The degenerative changes were followed by coagulation necrosis with slight tendency to caseation. Whether it is usual or unusual for tubercles developing in these situations in bovine animals to develop in this manner we are unable to state. We may say, however, that in man tubercles in the skin and subcutis rarely caseate and it is difficult to discover tubercle bacilli in the lesions.

Why this animal failed to show sensitiveness to tuberculin might be explained by the theory of desensitization, in other words, that the lesions were so extensive that the animal developed a tolerance on account of the tuberculin thrown into its system from the lesions. But from the history of the case, together with the failure to react to either of the local tests which are supposed to be very sensitive, it is difficult to accept this explanation. Is it not possible for an animal to become infected with tuberculosis and develop extensive lesions without becoming sensitive to tuberculin? Are all strains of tubercle bacilli capable of producing the same degree of hypersensitiveness in animals.?

From our present knowledge of the tuberculin reaction we are unable to answer these questions. We present them merely as hypotheses. When more is known regarding the mechanism of the tuberculin reaction, these hypotheses may become facts applicable to such cases.

It might be well to add that this bull was mated to sixty-eight cows during the last year. The number of matings during the last six months was as follows: February 10; March 17; April 7; May 2; June 8; and July 2. The calves so far born have been vigorous and healthy.

The entire herd was tested during the month of November, 1922, and with the exception of one animal passed a satisfactory subcutaneous test. This one animal gave a slightly suspicious reaction and on account of her being mated with this bull she was slaughtered. A necropsy failed to reveal any visible lesions of tuberculosis.

Dr. N. H. Howlett, who has been located at Cardiff, Md., has removed to Lansing, Mich. He gives his address as 617 North Hillsdale St.,

A FEW CASES MET IN PRACTICE*

By HERBERT LOTHE, D.V.M., *Waukesha, Wis.*

A Holstein cow, 11 years old. An extremely high producer in that she had three records of over 1000 lbs. of butter, one above 1000 lbs. of fat, in a year.

History: Except for cystic ovaries that yielded to treatment in two months, cow had enjoyed perfect health since last freshening, in September 1919. She was bred and conceived on April 22, 1920. On January 21, 1921 (nine months after conception) cow had been "off feed" for four days.

Symptoms: Cow appeared dull labor pains were absent. Pulse, respiration and temperature normal. Vaginal examination revealed a completely dilated cervix with unruptured foetal membranes protruding. The membranes were ruptured allowing coffee-colored, placental fluids to escape (color probably due to intra-uterine scouring of fetus). A slight amount of traction delivered a live but somewhat weak male calf, which got to its feet in a couple of hours. The afterbirth was expelled spontaneously about eight hours *post partum.*

On afternoon of January 22, 1921 cow showed no improvement in appetite but showed evidences of weakness of posterior extremities. The weakness and unsteady gait were taken for signs of milk fever and the udder inflated with air. Two hours later the pulse was found accelerated, temperature normal, mental disturbances (eyes staring) which gradually became more pronounced until convulsions, with biting of fore legs, foaming at mouth, champing of jaws became manifest. The respirations became accelerated and finally assumed the Cheyne-Stokes variety. (Cheyne-Stokes breathing is breathing where the respiratory rhythm is changed in such a way that the patient after a pause of several seconds begins to breathe with gradually increasing rapidity and depth, and then, after reaching an acme of hurried respirations, gradually decreases their rapidity and depth until they fade to nothing, when, after a pause the process is repeated).

Examination of the bladder showed that organ empty. After an hour or more the cow arose to her feet and appeared better, only to assume a recumbent position again with a repetition of the convulsions and Cheyne-Stokes breathing. Death occurred in

*Presented at the First Short Course for Veterinarians of Wisconsin, Madison, Wisc., January 24-25-26, 1923.

about eight hours. Three hours after the death of the mother the calf showed convulsions that apparently responded to a hypodermic of ½ grain of morphine sulphate. Eight hours later a second attack of convulsions appeared, with death to the calf.

Treatment: This consisted of inflation of the udder and camphor in oil intramuscularly. Later chloral hydrate was given to control convulsions, with no response.

Post Mortem: No gross changes were revealed except edema of the lungs.

The thing of interest to me is,—What caused the train of symptoms enumerated? Was this parturient paresis? Eclampsia? Puerperal septicemia? Uraemic poisoning?

Milk Fever: The case has this in common with milk fever; it occurred shortly after parturition; there was weakness of the posterior extremities, and hyperaesthesia does occasionally occur in milk fever. It differs from milk fever in that inflation of the udder had no beneficial effect; there were convulsions, with apparent consciousness between attacks of convulsions; there was no somnolence so commonly seen in milk fever; there was disturbed respiratory rhythm unlike any I have ever seen or heard reported (Cheyne-Stokes breathing) in milk fever, and the calf manifested symptoms such as I have never seen in the offspring of cows that have milk fever.

Eclampsia: Eclampsia in women is defined by Williams* as "an acute toxemia occurring in pregnant, partruient or puerperal women, and is usually accompanied by clonic and tonic convulsions, during which there is loss of consciousness, followed by a more or less prolonged coma, and frequently results in death". Post mortem the condition is characterized by changes in the liver. "These consist of irregularly shaped, reddish or whitish areas scattered thru the entire organ and originating near the smaller portal vessels. Ordinarily they are readily seen by the naked eye, and on section give the liver a mottled appearance. Under the microscope they are recognized as areas of necrosis, involving the periphery of the individual lobules and the portal spaces". These post-mortem changes are considered pathognomonic. Healy and Kastle, working at the Kentucky Experiment Station in 1912, advanced the view that parturient paresis and eclampsia are identical, in that they found albuminuria, changes in the nitrogen partition of the urine, and liver changes simula-

*Williams' Obstetrics, p. 568

ting those of eclampsia in cows with milk fever. These views are not generally accepted in that the liver lesions are not exactly those of human eclampsia.

In the case in question no examination of the urine was made as none was available. The characteristic liver lesions were not noted on gross examination and no sections were made for microscopic examination. The fact that the calf died in convulsions is suggestive of eclampsia as such occurrences are reported in the human. Cheyne–Stokes breathing does not seem to be a recorded symptom of eclampsia.

Puerperal Septicemia: The absence of temperature and the rapid onset and termination of the case is hardly that of puerperal septicemia.

Uremia: Uremia is defined as, "a toxemia from renal insufficiency developing in the course of nephritis or in conditions associated with anuria".* Clinically the symptoms are divided into cerebral, dyspnoeic and gastro-intestinal. The cerebral symptoms are those of mania, convulsions, coma and local palsies. The dyspnoeic symptoms are those of continuous dyspnoea, paroxysmal dyspnoea and Cheyne-Syokes dyspnoea.

In this case the post-mortem revealed no kidney lesions or obstructions to the ureters, but no microscopic sections were made so the condition may have existed. There was evidently suppression of urine but this condition also occurs in eclampsia.

It is to be regretted that urinary analysis and microscopic sections of the liver and kidneys were not made in this case, for in the absence of these it is impossible to state just what condition we had to deal with. It should be remembered, however, that our knowledge of the etiological factors of milk fever, eclampsia and uremia is very meager indeed, and that the scientific world realizes our profound ignorance of the subject. "Moreover, it should be borne in mind that totally different pathological conditions may be accompanied by identical clinical manifestations, so that a proper classification cannot be based upon the occurrence of such symptoms as albuminuria, fever, coma, or convulsions, but must be based upon our ability to isolate certain specific poisonous principles, or to demonstrate distinctive pathological lesions. Unfortunately the former is as yet out of the question, but the latter has already been accomplished along certain lines

*Osler's Principles and Practice of Medicine, pp. 688-690.

(eclampsia)".* This case illustrates the limitations of a purely clinical examination in determining the nature of toxemias.

Eversion of the Uterus.

You have no doubt all had a great number of cases of eversion of the uterus in the cow, with the experience that quite a percentage recover after replacement, but a small percentage of cases, apparently identical, either die before replacement has been accomplished or shortly after it is completed. I have had this experience quite often and have held a number of post-mortems to determine the cause of death. I wish to report two cases that are typical of what I have found.

Case No. 1. A red, grade Durham cow inverted her uterus some 20 minutes before my arrival at the farm. The afterbirth was attached and what appeared to be an unusual amount of uterus protruded from the vulva. Cow was lying flat on her side, much depressed and unable to get up. During the process of removing the afterbirth the cow gave a few struggles and died. Post-mortem revealed the peritoneal cavity and prolapsed uterus filled with clotted blood, the right, broad ligament was severed close to its attachment to the ovary and with it the utero-ovarian artery, from which the internal haemorrhage had occurred, I do not recall that I have ever seen this cause of death reported. The severing of the broad ligament of the pregnant horn allows that horn to protrude farther than otherwise and the condition may be suspected when the uterus seems unusually protruded.

Case No. 2. A grade Holstein cow inverted her uterus possibly three-quarters of an hour before my arrival. The afterbirth was not attached and the uterus was replaced after some little trouble, consuming about a half hour. A rope truss was being adjusted to the cow when she suddenly began to weave and dropped to the floor dead. A post-mortem revealed no internal hemorrhage but there was a great distention of the splanchnic veins with clotted blood. The mesenteric veins were about three inches in diameter and filled with clotted blood. This cow evidently died from what we know as "surgical shock".

All cases I have posted of cows that died suddenly after inversion of the uterus have fallen in these two classes.

*Williams' Obstetrics, p. 550.

AN OUTBREAK OF HEMORRHAGIC SEPTICEMIA IN SHEEP

By I. E. Newsom *and* Floyd Cross,

Colorado Experiment Station, Fort Collins, Colo.

Unfortunately fashion seems to be in vogue in medicine as well as in the matter of dress. In presenting this subject, therefore, we feel very much as one who would go down the street in the middle of January wearing a straw hat. A few years ago practically every outbreak of disease among domesticated animals, which was associated with the presence of subcutaneous or subserous hemorrhages, was diagnosed as hemorrhagic septicemia. We, ourselves, may have been guilty of adding fuel to that widespread flame and if so, we are ready to do penitence as may be required. We, however, differ with some investigators and writers in this field, in that we still feel as we have previously stated, that hemorrhagic septicemia is a real disease entity and must still be dealt with regardless of fashion.

No one appreciates any more than we that many diseases are associated with hemorrhages, and that there are many obscure diseases of the domesticated animals, the cause of which we little know, but we do feel that a distinct advance was made when it was determined that hemorrhagic septicemia was the cause of certain losses in live stock. It is in line, then, with our previous publications, that we present another outbreak which we have diagnosed hemorrhagic septicemia. Not that this is a rare condition in our experience, but rather that the special work done on this case, separates it from many of the others with which we have worked, and gives us reason to believe that the information here set down will be appreciated by others interested in the subject.

A band of three thousand lambs, weighing in at 54 pounds, was loaded at Sweet Grass, Montana, fed at Billings, at Casper and just out from Wendover, and arrived at the pens near Fort Collins, on November 7, 1922. Altogether they were on the road approximately eight days, the usual time being increased, owing to a severe snow-storm. When the lambs arrived, they showed evidence of having been on the road for some time, because some of them had the wool eaten from their backs;

otherwise they appeared rather strong and were in no case to be considered as cull lambs.

During the day they were allowed to run on beet and stubble fields, and were put in the pens and given alfalfa hay in self-feeders at night. No grain was given for approximately two weeks after arrival. Within a few days, some of these lambs were noticed to have a discharge from the nose and a considerable number showed crusted lips, which latter condition is common in feed-lot lambs during the first two weeks after arrival. The illness shown by the lambs, however, seemed to increase and deaths became more numerous, so that on the 19th, when they were first visited by the writers, there were about 200 noticeably ill and the loss to date had been approximately 50 head.

On examination, we found a considerable percentage of the swollen, crusted lips, quite a number showing purulent discharge from the eyes and nose, many showing dullness, but of four temperatures taken all appeared to be normal. The owner stated that coughing was rather noticeable in the lambs. While some of the smaller ones were among those dead, yet the loss was rather heavy among those that appeared to be strong and in a good condition of flesh.

Of four lambs posted, one showed marked evidence of pneumonia in the lower portion of both lungs, without other lesions. The other three showed no evidence of pneumonia, but did show the usual subserous and submucous hemorrhages, which we are prone to associate with hemorrhagic septicemia.

As the disease progressed, there was a larger percentage of those posted showing solidification of the lungs, and a smaller proportion showing the hemorrhages which are generally considered to be indicative of the acute type of disese. Gastritis and enteritis were seldom observed and scouring was not a noticeable symptom. The disease continued without abatement for the next six days, and from then on for the next two weeks an occasional lamb was lost, so that the total loss attributable to the outbreak was 116 head.

Some of the sick were removed to a hospital pen, and specially cared for, but no medicinal treatment was used on any of them, nor was any vaccine administered. An interesting factor was that these lambs were placed in the same pens and mixed with two thousand other lambs that had been received about two weeks previously. As far as could be determined, there was no

spread of the disease to the other lambs. This statement cannot be made as a positive fact, but it is believed to be true. This observation is in accord with many which have been made previously, and which seemed to indicate that the disease does not spread from one band to another.

Since the question had been frequently asked us, as to what percentage of lambs, in what we regarded as a typical outbreak of hemorrhagic septicemia, would show the bipolar organism, we determined to make special observations on that point in this case. As a consequence, the place was visited each day for the next six days, and material was brought to the laboratory where rabbit inoculations were made according to the table submitted herewith. These inoculations were carried out by taking a small portion of the tissue and emulsifying it in boiled water, after which approximately 2 cc of this emulsion was injected intraperitoneally into the rabbit. The accompanying table will show that of 34 rabbits inoculated, 32 died rather promptly, and from which a pure culture of *Pasteurella oviseptica* was obtained in each case.

Since it had been our belief that animals showing localization, oftentimes did not show the presence of the organism in the

TABLE 1

Rabbit No.	Tissue used	Inoculated	Died	Pure culture from heart-blood of rabbit
1	Spleen	11–19–22	11–20–22	+
2	Lung	11–19–22	11–20–22	+
3	Spleen	11–19–22	11–20–22	+
4	Spleen	11–19–22	11–20–22	+
5	Spleen	11–20–22	Lived	—
6	Spleen	11–20–22	11–22–22	+
7	Spleen	11–20–22	Lived	—
8	Spleen	11–20–22	11–21–22	+
9	Lung	11–21–22	11–22–22	+
10	Lung	11–21–22	11–22–22	+
11	Lung	11–21–22	11–22–22	+
12	Lung	11–21–22	11–22–22	+
13	Spleen	11–21–22	11–22–22	+
14	Spleen	11–21–22	11–22–22	+
15	Spleen	11–21–22	11–23–22	+
16	Spleen	11–21–22	11–22–22	+
17	Spleen	11–21–22	11–22–22	+
18	Spleen	11–22–22	11–24–22	+
19	Spleen	11–22–22	11–23–22	+
20	Lung	11–22–22	11–23–22	+
21	Lung	11–22–22	11–23–22	+
22	Lung	11–22–22	11–24–22	+
23	Lung	11–22–22	11–23–22	+
24	Lung	11–22–22	11–23–22	+
25	Spleen	11–23–22	11–24–22	+
26	Spleen	11–23–22	11–24–22	+
27	Spleen	11–23–22	11–25–22	+
28	Spleen	11–23–22	11–24–22	+
29	Spleen	11–23–22	11–24–22	+
30	Lung	11–25–22	11–26–22	+
31	Lung	11–25–22	11–26–22	+
32	Lung	11–25–22	11–26–22	+
33	Spleen	11–25–22	11–26–22	+
34	Spleen	11–25–22	11–26–22	+

general circulation, and as most of the later cases showed evidence of pneumonia, rabbits numbers 25 to 29 inclusive, and numbers 33 and 34 were given spleen emulsion rather than lung emulsion. In all seven cases, however, the rabbits died, just as did the others in the same series that were inoculated with lung. Conclusion should not be made from this finding that all cases of localization will show the presence of the organism in the general circulation, as our previous observations have been against this view. It did seem, however, in this case, that the organism was as readily isolated from the spleen as from the lung, even though pneumonia was quite well marked.

In order to show that this organism had pathogenicity for sheep, on the 17th of December a lamb weighing approximately 50 pounds was given 10 cc of a 48-hour bouillon culture intrajugularly. Another one was given 5 cc in the same manner on the same date. The lamb receiving 10 cc was found dead the following morning, cultures from the spleen showing the presence of *Pasteurella oviseptica*. The lamb receiving 5 cc survived.

Summary

An outbreak of hemorrhagic septicemia in sheep is here described, in which 116 lambs died out of three thousand. The history of the case would lead to the belief that the lowering of vitality, incident to shipping, was a very important factor in the onset of the disease, although it must be admitted that many bands passing through similar vicissitudes do not show any evidence of illness. The acute type of the disease seemed to be present early, which later developed into a marked pneumonia. Of 34 rabbits inoculated from tissue emulsions from 34 different sheep, 32 died, revealing pure cultures of *Pasteurella oviseptica*. The statement should be added that our unpublished observations, extending over a period of years, do not support the prevailing view that *Pasteurella oviseptica* can be regularly isolated from sheep dying from a great variety of diseases.

Self-Preservation

A Hint to Hens.—An Ottawa hen laid an egg daily for 107 days. There's a saying in every hen-house that an egg a day keeps the hatchet away.

Judge.

TUBERCULOSIS CONTRACTED BY A FAMILY FROM A TUBERCULOUS COW

By E. D. King, Jr.., D. V. M.

Valdosta, Ga.,

Mr. W. D. Odom, of Columbus, Ga., formerly of Valdosta, Ga., who used the milk of a tuberculous cow for his family to prove that he did not believe in its existence in cows ten years ago, and which disease has caused the death of his wife, the permanent disability of his son and the hospitalization of his two daughters, now believes that tuberculosis can be contracted from cows. His statement follows:

"In the fall of 1912 the dairy herd of Mr. O.H. Hightower was tested for tuberculosis by Dr. W. M. Howell, and two cows were put out of the dairy. One was killed as a reactor and one was called suspicious and the suspicious one was taken to my premises and milked. I felt that the office of Milk Inspector was a graft, to give some man an easy job, and did not believe that there was any such thing as tuberculosis in cows. This cow was fed, just as those in the dairy were fed, and in one month she looked so bad that I was afraid to milk her, She was given back to Mr. Hightower.

"My son, Jesse, developed tuberculosis the next year and has had it until the present time (about nine years) and my wife, I believe, contracted it from the boy.

"The boy was kept in the Hospital (Scottish Rite Hospital for Crippled Children) at Decatur, Ga., for four years, and on his back for nine months, where part of the bone of the neck was removed and a part of the leg bone used to replace it, and the bone of a sheep used to replace the leg bone.

"My two daughters are now in the tubercular hospital at Alto, Ga., and I believe that they contracted the disease from their mother, who was buried here today.

W. D. Odom"

Mr. Odom was an employe in the above-mentioned dairy about the time that meat and milk inspection was started, and had subscribed to the belief of some that it was not beneficial, and to prove his sincere belief that it was all wrong, took the cow against the advice and quarantine of the Meat and Milk

Inspector, but during the time he was milking the cow, the reactor (positive case of tuberculosis) was killed. He saw the post-mortem of this reactor and states that she was practically "eaten up" with it. At this time, John O'Neal was employed at the dairy, also, and he continually warned Mr. Odom that he was making a mistake, and too, his suspicions began to look as if something must be wrong with her, as she did not improve on the same kind and quantity of feed that the dairy cows were getting. This created a doubt in his mind as to the advisability

These people now believe that bovine tuberculosis is a menace to human health.

of using the milk from his suspicious cow. He returned her to the owner and in a short time she, too, was killed and proved to be a generalized case of tuberculosis, which fact has been established by Dr. Howell, who was then Meat and Milk Inspector of Valdosta, and made the tests and post-mortem. He states that she was, in his opinion, capable of spreading the disease.

Mr. Odom's son, Jesse, whose photograph is shown, is seventeen years of age and weighs 51 pounds. Nine years ago he weighed 55 lbs. He spent four years in the Scottish Rite Hospital for Crippled Children, and was discharged when he reached the age of fifteen years, because this was the age limit, and during

this time underwent two operations of bone transplanting, and was kept in one position, with weights keeping his legs extended, as his muscles were unable to keep his legs from drawing up. He can walk very well now, but will never be able to do much work.

Mrs. Odom suffered for seven years with the disease, and bore her misfortune with Christian fortitude, and said many times that she had hoped that no one else would have to suffer as she had. This statement was the chief reason for her relatives giving their consent to publicity and they readily consented to help assemble the facts that would tend to warn others of the danger of the tuberculous cow.

Mrs. Odom's mother is in possession of a photograph showing five generations of her family. Her grandfather lived to be ninety-one years of age and her father 66. Mrs. Odom's mother looks to be not over 45 and has married grandchildren, and nothing can be found to indicate that there ever has been any tuberculosis in the family until this cow was used, but everything that can be learned tends to show conclusively that the entire trouble started from the cow.

This investigation has been made by the Board of Health at Valdosta, in co-operation with the State Veterinarian, and the U.S. Inspector in Charge of Tuberculosis Eradication for Georgia, ably assisted by all the civic organizations in Valdosta. The greater part of the investigation done outside of Valdosta has been done by representatives of the State Livestock Sanitary Board and the Bureau of Animal Industry, under the general supervision of Dr. A. L. Hirleman, U.S. Inspector in Charge of Tuberculosis Eradication for Georgia, which forces are actively and aggressively combating tuberculosis in animals.

From the above it does not seem that there remains any doubt that the tuberculous milk-cow is a serious danger to our public health.

The Bureau of Animal Industry has a moving picture,"Out of the Shadows", that shows the transmission of bovine tuberculosis to Mary Benton, and her recovery after three years in a tuberculosis infirmary. This was exhibited by the Board of Health of this City last April, and the total cost to the city was less than $15.00 The local picture show management gave the theatres, electricity and operators free, and the Bureau loaned the film.

OBSERVATIONS ON THE TREATMENT OF PURPURA HEMORRHAGICA

By E. R. Steel, D. V. M.

Grundy Center, Iowa.

In presenting this paper to the Association it will not be my purpose to go into the causative factors of purpura, but to give to you some facts learned in the experimental field and the school of experience. I hope that I am not at this time giving anything of sensational character and am not claiming for the treatment, as outlined, that it is a specific, but as used by myself in a large number of cases I believe it of sufficient value to present to the Association.

In speaking of the experimental field, I wish to state that this treatment was worked out by Dr. Joseph Wall, now of Harlan, Iowa, Dr. F. R. Ewing, of Shrieve, Ohio, and myself, while we were stationed at A. R. D. No. 317, Camp Pike, Arkansas, where we were in a position to have a large number of cases of purpura under our observation.

Potassium dichromate has for years been considered by a great many practitioners as one of the most useful drugs in the treatment of purpura and, I think, by a great many it has been of little use because, first, of the inability, in a great many cases of purpura, to give the drug *per os* on account of the swollen condition of the nostrils, lips and head in general. On the other hand, the irritant properties of the drug and the general disturbance of the digestive organs caused by it, renders the drug useless and probably many times harmful. Probably another reason for the poor results obtained from the use of this drug is due to the small dosage used, five to eight grains, which may be beneficial as an alterative to the upper respiratory tract but is useless in acute febrile diseases such as purpura.

These facts being established, we began to seek a method of administration of the drug to overcome its disadvantages, and concluded to try intravenous injections of a solution in sterile water. We began by giving ten grains daily, in the jugular vein, with beneficial results and continued this method of administration, increasing the dosage until we gave as high as forty-five grains at a dose, repeated in forty-eight hours in severe

cases, with no apparent harmful but unusually gratifying beneficial results.

We continued along this line and I have come to the conclusion that twenty to twenty-five grains, administered in eight ounces of sterile water, at intervals of forty-eight hours, would be about as near a standard as possible to arrive at in the average case, this to be varied as to the severity of the case and size of the animal.

I clip the hair over the jugular about midway of the neck, and paint the skin with iodine. By putting pressure on the lower part of the jugular, and stopping the flow of blood, the vein is caused to expand so it is easy to puncture with an ordinary sixteen-gauge hypodermic needle, the blood flowing in a steady stream through the needle when the lumen of the vein is reached. I then use a large-sized hypodermic syringe to inject the solution which has been made up previously by dissolving as many five-grain potassium dichromate tablets as I wish to use for one dose, in eight ounces of water which has been sterilized by boiling. This material I inject slowly through the needle into the blood-stream. Before withdrawing the needle I inject a small amount of sterile water, to rinse out any of the solution in the needle, because owing to its irritant nature, if it escapes into the tissues overlying the jugular, it will cause severe swelling and even sloughing if any considerable amount is allowed to escape. In one experimental case the lumen of the vein was completely closed by repeated injections of too concentrated a solution.

Potassium dichromate administered in this manner, in addition to its alterative properties, is a powerful heart stimulant and regulator, slowing the rapidity of the heart-beats and strengthening their force. This action continues for several hours, in fact longer than from any other drug I have observed, and for this reason I recommend the doses to be at intervals of forty-eight hours. Usually in the most severe cases marked diminution in the swelllng of the head and limbs can be observed within forty-eight hours after administration of the first dose. Subsequent doses may be regulated according to the condition of the patient.

The question will arise in some minds, as to the methods of administration admitting air to the blood-stream. I have never had any trouble on this account, in fact have injected air into the jugular in experimental cases, and have as yet to see any

harmful results or any change in the condition of the animal whatsoever.

It has been my experience that in using the treatment as outlined, that it is seldom necessary to use the tracheotomy tube, if the case is not too far advanced before the treatment is begun. When it is used, it is not usually necessary to use it for more than two to three days. As stated in the beginning, this treatment is not a panacea or a specific, but one that has been of value in my practice.

Dr. Harold B. Elliott is a member of the Rotary Club of Hilo, Hawaii, and suggests that for the benefit of the veterinary profession, the classification of Veterinarian should be filled in every rotary club in the world. The following is taken from the Souvenir Holiday Number of the Lava Flow, which is designated as the Bi-Weekly Eruption of the Rotary Club of Hilo:

"Rotarian Welcome To Aloha-Land

By Charles Eugene Banks

How shall we symbolize you, O Rotarians!
Hopeful as morning, the sun rising clear,
Citymen, countrymen, tradesmen, agrarians,
Bringing in happiness, banishing fear;
Welcome, thrice welcome! Aloha-land greets you,
If 'round the earth you should travel, we know,
Whoever smiles on you, handshakes you, meets you,
Feasts you and fetes you-wherever you go-
The joys of our paradise once you have tasted
Time spent with others you'll think is just wasted."

Dr. G. A. Roberts has accepted a position in the Agricultural School at Lavras, Minas, Brasil. Dr. and Mrs. Roberts sailed for Brasil on the steamship Pocone, January 20th. They expected to visit all of the important ports of Northern Brasil, including Para, Ceara, Pernambuco and Bahia, on their way down to Rio de Janeiro. Many of the members of the Association who attended the meeting at St. Louis, has the pleasure of meeting Dr. Roberts there.

THE TREATMENT OF TETANUS

By N. S. Mayo, *Chicago, Ill.*

Tetanus is much more frequent in animals than in man. In a recent number of the Journal of the American Medical Association, Drs. Goler and Reitz, of Rochester, New York, report a case of tetanus in a man without evident portal of entry. This case and several others reported recovered. The treatment administered was tetanus antitoxin and magnesium sulphate subcutaneously. In Cuba tetanus in horses without visible wound was quite frequent and was called by the natives "moon tetanus". Such cases were usually milder in character than those resulting from wound infection.

In 1916, Meltzer, of the Rockefeller Institute for Medical Research, reported upon the "Inhibitory Properties of Magnesium Sulphate and Their Therapeutic Action in Tetanus" * and gives the following summary:

"The best general plan for the treatment of tetanus would seem to be as follows:

"In each and every case of tetanus, 1.2 c.c. of 15 percent solution of magnesium sulphate should be given by subcutaneous injection three or four times a day throughout the entire disease.

"When the disease is complicated by severe tetanic attacks, 1 c.c. of a 25 percent solution for every 10 kg. (20 pounds) body weight (in adults) should be given by the intraspinal method.

"When the disease is attended by immediately dangerous tetanic complications, from 2 to 3 c.c. per minute of a 6 percent solution of magnesium salts should be given then by an intravenous injection until dangerous symptoms subside or the respiration becomes shallow or too slow.

"When the respiration seems to become impaired in consequence of the administration of magnesium salt methods, calcium chlorid should be injected in the manner described above.

"It is advisable to have at hand an apparatus for intra-pharyngeal insufflation ready for use, whenever the respiration becomes slow or shallow.

"Finally, the simultaneous treatment by antitetanic serum should not be neglected".

While intraspinous injections are not practical in horses, the

*The Journal of the American Medical Association, page 931.

magnesium sulphate and tetanus antitoxin can be given intravenously in severe attacks. Dr. Meltzer advises a 6 per cent solution given at the rate of 2 to 3 cc per minute, or a 3 per cent solution given at the rate of 5 to 6 cc per minute. In giving magnesium sulphate the respiration should be carefully watched and the injection discontinued immediately, should the respiration become slow or shallow.

BOVINE "FINGER PRINTS"

It is interesting to note the recently-recorded fact that the muzzle of the ox possesses an individuality in its surface-marking analogous to the whorls and arborifications present on the surface of human finger-tips, and that individual records are made of such with the same or even greater ease than in the case of man.

In an extensive series of tests no approach to identical distribution of line or pattern has been noted and the markings at birth persist throughout the life of the animal.

In the case of human beings recent observation has shown that the orifices of these sudoriferous glands disposed along and amidst the skin rugae, form of themselves an additional complex, tending further to increase the highly individualistic and specific character of the finger print. As the sweat-glands are particularly well developed in the muzzle of the ox, it is probable the orifices of the same will tend also to further enhance the specific nature of the "nose print." Some such ready means of differentiation has long been sought in the case of the horse, and the modern tattoo mark on the gums is a poor substitute for a "finger print" as regards its potentialities for identification. The value of such means of differentiation in the case of the ox is, of course, obvious and the stock-books of pedigree cattle will welcome a ready means of avoiding substitutions or ensuring identity, while the efforts of the scientist in preventive measures may conceivably be greatly aided. Individual differences of a constant nature exist as certainly in the dermal structure of animals of other species as exist in the case of the man's finger-tips or the ox's muzzle, and, should the need arise, such differences will doubtless be found capable of demonstration.—*Veterinary Notes in Journal of State Medicine (London.)*

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

KITTEN TRANSMITS RINGWORM TO HUMANS

By E. I. Smith,

Nashville, Tennessee

The writer had occasion to observe a case of ringworm in a family where a white Persian kitten had just been purchased from a cattery. The kitten appeared normal and healthy. However, a close examination disclosed a skin lesion on the nose and one or two pale red spots on the ears. As a matter of form, tincture of iodine was painted on the lesions and good results observed. In about ten days the child showed unmistakable lesions of *Tinea circinata* on the breast and arms. The infection seemed to be rather virulent and was accompanied by an extreme itching and burning sensation. The appearance of the lesions was alarming and caused no small amount of anxiety. A physician was consulted, but he failed to recognize it as Tinea. According to reports he made an empirical deduction by stating that it was some ordinary skin disease and prescribed an ointment which did not appear to be indicated.

After the expiration of about fifteen days the writer felt an itching sensation on the back of his hand. A red circle appeared, about one-quarter of an inch in diameter and rapidly spread to about three times its original size. At this juncture tincture of iodine was used both on the child and the writer, which brought an early improvement and permanent recovery. The remaining lesions of the cat were similarly treated and he was given frequent, warm-water baths with plenty of soap. At the present writing the cat appears to be free from the lesions and the family have experienced no further trouble with the Tinea.

The writer takes it for granted that the above described cases are infrequent, and therefore it is easily understood why the average physician or veterinarian fails to diagnose the trouble accurately.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Meeting of Executive Board, LaSalle Hotel, Chicago, Ill., December 6, 1922.

The Executive Board of the American Veterinary Medical Association convened at the LaSalle Hotel, Chicago, Ill., at 10:50 o'clock, December 5th, 1922, Dr. Cassius Way, Chairman of the Board, presiding: The following were present:

Dr. Cassius Way, Chairman (Member at-Large)
Dr. T. E. Munce (District No. 2)
Dr. J. A. Kiernan (District No. 4)
Dr. C. E. Cotton (District No. 5)
Dr. B. W. Conrad (District No. 6)
Dr. W. H. Welch, Pres.
Dr. M. Jacob, Treas.
Dr. H. Preston Hoskins, Sec.

Secretary Hoskins reported that the nominating ballots for the election of a member of the Executive Board for District No. 1 had been prepared and would be mailed on December 11, 1922. He reported that he had found it possible to mail the ballot in the form of a multigraph letter at a lesser expense than would be incurred in having the customary printed, postal-card forms. He further reported that there were 166 members in the District in good standing, although some of these had not yet paid their dues for the current year. He asked for instructions as to the eligibility of such members to vote in the election, if their dues for the current year were not paid.

The Secretary reported that he had been instructed by the former Secretary, Dr. Mayo, that no member could vote at any election, unless all indebtedness to the Association had been paid. Action on this matter was deferred until such time as the Secretary could again get in communication with Dr. Mayo. (Dr. Mayo called attention to Section 1, Article 15 of the By-Laws, which reads as follows: "No member may vote at a regular meeting until he has registered and paid his entire indebtedness to the Association." Dr Mayo stated that it had been customary

to so interpret the By-laws in district elections of Executive Board members.)

The Secretary reported that he had received from Dr. Mayo all of the properties in connection with the office of Secretary and that he had started to function as Secretary on the first day of October.

The Secretary reported having attended the annual meeting of the Michigan-Ohio Veterinary Medical Association at Adrian, Michigan, on November 15th, 1922. He reported that he had been asked to attend this meeting and give a talk on "The Outline of the American Veterinary Medical Association Program for the Coming Year." The Secretary called attention to the fact that it appeared as though the Association did not have at that time, what might be termed a definite policy, or any program mapped out for carrying out such a policy, and that it would be very desirable if the officers of the Association could outline some sort of a policy toward which he might work, so far as the conduct of the office of Secretary was concerned.

Dr. Munce called attention to the fact that he had been on record for three years as to the desirability of the Association having a definite, comprehensive, forward-looking plan or policy along which to function, and that he had come to this meeting prepared to offer a resolution to the Executive Board. Dr. Munce was invited to read the resolution.

The resolution follows:

"WHEREAS, The objects of the American Veterinary Medical Association are:
(a.) To promote and protect the interests of the veterinary profession.
(b.) To raise the requirements of veterinary education.
(c.) To procure the enactment of uniform laws and regulations governing the control of animal disease pertaining to veterinary medicine.
(d.) To carry out the enforcement of these laws and regulations.
(e.) To encourage public opinion, through various means, regarding problems of animal hygiene.
(f.) To promote good fellowship in the profession.
"WHEREAS, It is recognized that this Association to function properly, to progress and to render the greatest service possible, must have a definite policy. (This policy setting forth its purpose, principles and scope of activity, namely; the relation of the profession to agriculture, public health measures, veterinary education, the practitioner, government regulatory or military service, agricultural extension, veterinary legislation, humane measures, allied organizations, veterinary biologies, publicity and such other matters that are of interest and vital concern to the profession.)
"WHEREAS, The American Veterinary Medical Association, conceded the largest and most influential veterinary organization in the world, is without such a policy; therefore be it
"RESOLVED, That the chairman of the Executive Board be empowered to appoint a committee to draft a suitable policy for the American Veterinary Medical Association; and be it further
"RESOLVED, That said committee submit a report at the meeting of the Executive Board at Montreal."

Dr Munce moved for the adoption of his resolution. Dr. Conrad seconded the motion. In the discussion which followed, President Welch asked to be allowed to read a message which he

had prepared for the Executive Board. Dr. Way asked Dr. Welch to read his message, which was as follows:

"To The Executive Board of the A. V. M. A.

Greetings:—

In all times past the influence of the American Veterinary Medical Association has been directed towards the strengthening and betterment of all phases of Veterinary activities. Chiefly through its instrumentality, the standard of our schools has been gradually and materially elevated until at present they unquestionably compare very favorably with those of our sister profession of medicine, and so also, do our graduates of recent years.

To secure increased rank and social standing for the Army Veterinarian has likewise been one of our constant aims, and persistent efforts along that line have finally been fruitful of results. Furthermore, repeated efforts to secure adequate compensation for those of our profession who are employed in the Bureau of Animal Industry, while leaving much to be desired, have at least been productive of a bettering of their conditions.

There remains one phase of veterinary activity, representing fully 90% of our entire profession, the condition of which today demands that some definite policy of action be adopted by our Association, towards the righting of certain wrongs that are jeopardizing the interests and very subsistence of this very important branch of our profession. I have reference to the private practitioner, and cite as some of the injustices and indignities to which he seems obliged to submit, the following as examples:—

"The Federal and State Governments have, in many instances, usurped the right of tuberculin testing of cattle, thereby depriving him of that source of revenue, and a portion of the work in his locality which he is eminently qualified to perform.

"Tuberculin, hog cholera virus, anthrax and blackleg vaccines, as well as other viruses, dangerous in the hands of the incompetent, are permitted to be sold and distributed to the laity, thereby constituting a grave menace to the entire live stock industry, by virtue of taking the control of contagious and infectious diseases from the hands of the veterinarian, who is the only person qualified to cope with those problems intelligently, besides resulting in a considerable lessening of the income of the local practitioner in the territory where this is practiced.

"Again, there are certain schools in good standing in our Association that are said to accept tuition from students to educate them in the art and science of veterinary medicine, and at the same time are said to be guilty of giving instructions to farmers in the art of administration of certain of these vaccines. A dean of another veterinary college is also said to distribute hog cholera serum and virus to farmers.

"As matters stand at present, the future of our profession is in a very precarious condition. Without question, fully 95% of all students matriculating in our veterinary colleges, do so with the expectation of engaging in practice upon graduating. At the present time, with the prospect of county agent activities in the matter of hog cholera vaccination, even the most far-sighted of our profession cannot bespeak a promising future for the practitioner with any too great a certainty. As a result, our schools are practically empty, and will remain in this condition until such time as the field of the veterinarian is not unjustly encroached upon, and is definitely outlined by legislation. I consider that no question of greater importance has ever confronted our profession and upon its solution depends our future.

"You ask what can be done. I suggest that what we need first is a well-defined policy outlined, for which we will be able to secure the enthusiastic cooperation of every state veterinary association, as well as every individual constituting our profession. It should be dealt with as a national question, and the question of whether the eradication and control of contagious and infectious diseases are to be handled by veterinarians or whether we are to be hampered by the laity should be settled once and for all. A law governing the distribution of viruses would protect the stockman against his own ignorance and serve the needs of the veterinary profession. I ask that at this time you give earnest consideration to these matters, and if possible outline some definite plan of procedure, for which the entire profession can work as a unit.

Very sincerely,
(Signed) W. H. WELCH."

After considerable further discussion, which was entered into by all present, the motion to adopt Pres. Welch's resolution was carried.

Discussion then turned to the desirability of the Secretary attending as many of the winter meetings of the various state associations as possible, with the result that the Secretary was instructed to attend as many of these meetings as he could, and the hope was expressed that the President and Executive Board

members would find it possible to attend those meetings which the Secretary found it impossible to attend.

The Secretary called attention to the plan which he had started at the Michigan-Ohio meeting, of having each State or local association appoint a committee as a clearing house for grievances, the same to be transmitted to the Secretary of the American Veterinary Medical Association for guidance in shaping the activity of the Association along lines most needed.

Treasurer Jacob rendered a report of the financial status of the Association up to December 2, 1922. This report showed that the total assets of the Association at that time amounted to $43,111.74. The Secretary then asked for some instructions relative to the expenditure of the $1000.00 which had been appropriated for publicity purposes. Attention was called to the fact that the original purpose for which this money had been appropriated was for general publicity through the agencies of the general press amd agricultural publications. Dr. Cotton called attention to the desirability of doing something that would attract and encourage young men to enter the veterinary profession.

The Secretary reported that he had made some plans for taking a veterinary census of North America, involving the compiling of a complete list of all veterinary graduates in the United States and Canada. He also called attention to the desirability of publishing a directory, including the Constitution and By-laws, in the near future, a matter that had been deferred the past year on account of the expenses. It was decided to defer this matter in view of the fact that the machinery had already been set in motion for making numerous changes in the Constitution and By-laws. The Secretary called attention to numerous requests received for an interpretation of our Code of Ethics. He suggested that the time had arrived when a more liberal interpretation was indicated, owing to the fact that no small number of veterinarians were now specializing along some particular line of practice and they desire to advertise their specialities in a way that would be unobjectionable and within the law, so far as the Code of Ethics was concerned.

The Secretary asked for further instructions relative to the lapel emblem, the design for which had been submitted and adopted at the St. Louis meeting. It was decided to order 1000 gold-filled emblems at the price quoted, these to be sold to the members at fifty cents each.

The next matter called to the attention of the Board by the Secretary, was an apparent error committed at the St. Louis meeting in rejecting the application of Dr. Sam. W. Wiest, of New Mexico, a graduate of the St. Joseph Veterinary College of the year 1919. This application had apparently been rejected for the reason that the St. Joseph Veterinary College was not recognized that year. Dr. Mayo had notified Dr. Wiest to this effect, and Dr. O. E. Troy, Resident Secretary of New Mexico, had called attention to the apparent error in declining membership to Dr. Wiest. Examination of the records seemed to substantiate the claim of Dr. Troy that an error had been committed, as the St. Joseph College was not discredited until the New Orleans meeting, December 1919, and Dr. Wiest, the applicant, had graduated from the institution in question the previous Spring. Dr. Cotton moved that the Executive Board recommend Dr. Wiest favorably to the Association at the Montreal meeting. The motion was seconded by Dr. Kiernan and carried. The Secretary was instructed to make the necessary explanations in connection with this case.

The next matter to which the Secretary directed attention was an apparent inaccuracy in the Proceedings relative to the disposition of the report of the Committee on Anatomical Nomenclature. The action of the Secretary, as shown in the correspondence with Dr. Sisson, Chairman of the Committee, was sustained.

Attention was directed to the action of the Board at the St. Louis meeting, in rescinding the previous action of the Board relative to members of the Association who did not desire to take the Journal. The Secretary was instructed from that time on, that all members must pay dues in full and take the Journal.

The Executive Board voted to provide the Secretary with a revolving fund of $500.00, to take care of salaries of office assistants, cash purchases, and various petty expenses.

The Secretary asked for instructions as to the disposition of his surety bond for $5000.00 Chairman Way reported that he was in possession of the surety bond for $25,000. covering the Treasurer, and that said bond was in his safety deposit vault in the Irving National Bank, New York City. Dr. Munce moved that the Chairman of the Executive Board be designated custodian of all surety bonds of the Association. The motion was seconded by Dr. Kiernan. Motion carried. After considerable discussion, Dr. Cotton moved that the Secretary file a bond for

an additional $5000, making the total amount $10,000, covering the three positions of Secretary, Editor and Business Manager of the Journal. The motion was seconded by Dr. Munce and carried.

Chairman Way called attention to the fact that no action had been taken with reference to the dates of the Montreal meeting. Dr. Kiernan stated that the dates had not been definitely fixed, but had been left to the Local Committee on Arrangements, and this committee was to advise the Executive Board later on. (The Executive Board decided to recommend to the Montreal veterinarians the following dates: August 27-28-29-30-31.) Pres. Welch reported that he would get in touch with the Montreal veterinarians relative to the formation of the Local Committee on Arrangements.

The meeting adjourned at 1:25 o'clock to reconvene as early as possible in the afternoon for a joint session with the Committee on Revision of the Constitution and By-laws.

First Joint Session of Executive Board and Revision Committee

The joint meeting of the Executive Board and the Committee on Revision of Constitution and By-laws was called to order at 2:40 o'clock, Chairman Way presiding. The following Executive Board members were present: Drs. Way, Munce, Kiernan, Cotton and Conrad; President Welch and Secretary Hoskins. The Committee on Revision was represented by Drs. J. H. McLeod, Chairman, C. A. Cary, A. T. Kinsley, W. M. Bell.—Absent, L. A. Merillat. Chairman McLeod reported that his committee had met that morning in pursuance of the request made by Ex-President Kinsley, at St. Louis. He reported that Dr. Mohler had found it necessary to resign from the committee, and that this vacancy had been filled by the appointment, by President Welch, of Dr. W. M. Bell, Nashville, Tenn.

For the Revision Committee, Dr. Kinsley presented the following recommendations:

1. (a) That nominations for President be made from the floor at the regular annual meeting one year preceding the time of assuming office, and that the election be by mail ballot within sixty days after the nominations.
   (b) That the names of the nominees for President be pub-

lished in the official Journal within thirty days after nominations are made.

2. That there be six Vice-Presidents, one from each District, nominated and elected in the same way as the President.
3. That the President and six Vice-Presidents be active members of the Executive Board.
4. That a committee of five on credentials be created, this committee to be appointed by the President. Each member of this committee shall hold office for five years, except the first committee appointed under this Constitution, one of which will serve for one year, one for two years, one for three years, one for four years and one for five years.

Dr. Kinsley reported for the Revision Committee that it did not seem feasible to make an entire revision at this time, but to recommend amendments which would give each member of the Association a voice in the election of officers; that it had also appeared advisable to the Committee to recommend increasing the personnel of the Executive Board, by adding seven members, who would serve for a short time, namely, one year. By such a plan, one-half of the Executive Board would be elected each year. The President and six Vice-Presidents would serve during their period of office as active members of the Executive Board, making a total of 14 members on the Board. Dr. Kinsley spoke in favor of the amendment, stating that he thought it would stimulate a great deal of interest in all those sections of the country from which there is a very small representation at any of the annual meetings. Dr. McLeod reported that the Revision Committee had received resolutions from the States of Missouri, Idaho, Colorado, Iowa and Oklahoma, asking that changes be made that would make the Associations more representative of the general body of veterinarians.

Dr. Munce called attention to the desirability of having some change made relative to the manner of election of Section officers. The Secretary also called attention to the loose way in which some of the Section elections had been held in the past, and pointed out the desirability of each member, upon registering at a meeting, identifying himself with some particular Section, as is done in the American Medical Association. Any such arrangement need not interfere with the man attending the meetings of any one of the three Sections, but it would

identify him as being most interested in some one of the three.

Dr. Cary called attention to the desirability of having the fiscal year very definitely defined, and Secretary asked for instructions in this connection, as to the exact time that a member would become delinquent on account of the non-payment of dues. It was agreed that those members who had not paid their dues for the year ending September 1, 1921, will have forfeited their membership in the Association thirty days after notification, a statement of the dues in arrears to be considered such notification.

The Secretary then presented a plan which would entirely change the present system of admitting new members. He called attention to the disadvantages of the present system, especially the great amount of detail work thrown upon the Executive Board at the time of the annual meeting, and the tendency for prospective members to delay applications for membership until just before the annual meeting. (The plan is crystalized in the proposed amendment to Section 6 of Article 2 of the By-laws, on page 784).

Dr Cary then proposed that the Secretary take all of the suggestions and proposed changes and make a draft of them, which would be presented at a future session of the two committees, in order thet the proposed amendments might be again discussed more intelligently, and unnecessary duplications and inconsistencies avoided, and this draft to be published in the Journal, so as to give the members an opportunity of studying proposed changes before the meeting in Montreal.

Chairman Way announced the following Committee on Policy:

Dr. T. E. Munce, Chairman
Dr. John R. Mohler
Dr. D. H. Udall
Dr. L. A. Merillat
Dr. C. E. Cotton
Dr. M. Jacob
Dr. W. H. Welch
Dr. H. P. Hoskins, Secretary

The meeting adjourned at 4:15 o'clock, to reconvene the following morning at 9.

Second Joint Session of Executive Board and Revision Committee

It was found impossible for the committee to meet at 9 o'clock on Wednesday, December 6, 1922, so the joint conference was not held until 5:30 o'clock. Present, Drs. Way, Munce, Kiernan, Cotton, Conrad and E. A. Watson (representing District No. 1), Secretary Hoskins, Drs. Bell, Cary, Kinsley and McLeod. The Secretary presented his draft of the proposed amendments to the Constitution and By-laws, as submitted by the Revision Committee, the day previously, and modified in joint session with the Executive Board. It was decided to take up these proposed amendments and discuss them seriatim. In the case of each proposed amendment, a motion was made, duly seconded and carried, that these amendments be embodied in the plan of revision of the Constitution and By-laws, to be submitted for consideration by the Association at the next annual meeting after having been published in the Journal. It was agreed by all present that it would be well to have the Secretary make a new draft of the proposed amendments and send a copy to each member of the Executive Board and the Revision Committee, for his approval, before publication in the Journal. The joint session adjourned at 8 o'clock.

Following are the amendments which will be offered at the Montreal meeting. This draft of the proposed changes has been approved by a majority of the members of the Executive Board and the Revision Committee. Such approval does not in any way mean that every member of both of these bodies approves every one of the proposed amendments. Approoval means only that the Secretary correctly interpreted and worded the recommendations of the Revision Committee in his draft of the proposed amendments to be published in the Journal.

CONSTITUTION

Article V—Officers

Section 1 now reads as follows:

The officers of the Association shall consist of a President, five Vice-Presidents, a Secretary, a Treasurer and an Executive Board. With the exception of the Secretary and District members of the Executive Board, they shall be elected at the regular annual meeting and hold office for one year from the date of their election, or until their successors are elected and have assumed office. No person shall be eligible to the offices of President, Vice-President, Secretary or Treasurer unless he has been a member in good standing for the five years preceding his election.

Proposed to be amended to read as follows;

The Officers of the Association shall consist of the President, six Vice-Presidents, one of whom must be a resident of each Executive Board District, a Secretary and a Treasurer. No person shall be eligible to the offices of President, Vice-President, Secretary or Treasurer unless he has been a member in good standing for five years preceding his election.

Vice-Presidents

Section 3 now reads as follows:

In case of death or resignation of the President, or in case of his inability to perform the duties of his office from any cause, the same shall devolve upon the Vice-President, in seniority, for the remainder of the unexpired term, or until the disability shall be removed.

Proposed to be amended to read as follows:

In case of death or resignation of the President, or in case of his inability to perform the duties of his office from any cause, the presiding officer shall be selected by the Executive Board from the Vice-Presidents.

Secretary

Section 4 now reads as follows:

The Secretary shall perform all the clerical duties of the Association, and be the custodian of all its property except moneys and the properties of the official Journal office. The Secretary may also act as Editor or Business Manager, or both, of the official Journal when so recommended by the Executive Board, and approved by the Association. All moneys received by him shall be paid monthly to the Treasurer. He shall receive such salary and allowances as may be recommended by the Executive Board and approved by the Association.

He shall give bond to the Association in the sum of five thousand dollars ($5,000), acceptable to the Executive Board. He shall present a written report at the regular annual meeting.

Proposed to be amended to read as follows:

The Secretary shall perform all the clerical duties of the Association, and be custodian of all its property, except money and surety bonds. The Secretary may also act as Editor or Business manager of the Journal or both. He shall give bond to the Association in a sum acceptable to the Executive Board. He shall present a written report at the regular annual meeting.

Treasurer

Section 5 now reads as follows:

The Treasurer shall account to the Association for all moneys received. He shall give bond to the Association in the sum of ten thousand dollars ($10,000), acceptable to the Executive Board, At the expiration of his term of office he shall account for and turn over to his successor in office all moneys, vouchers and account books belonging to the Association.

The Treasurer shall pay out moneys only on vouchers countersigned by the President and Secretary, or President and Editor, excepting minor expenses

of the Secretary, and such revolving fund allowances as may be placed at the disposal of the Editor and Manager of the Journal by the Budget Committee.

The Treasurer shall at the regular annual meeting present a written detailed report with vouchers covering all receipts and expenditures.

Proposed to be amended to read as follows:

The Treasurer shall be elected at the regular annual meeting, by ballot, and shall assume the duties of said office on the first day of January next succeeding his election, and shall continue in office for one year. He shall account to the Association for all moneys received. He shall give bond to the Association in a sum acceptable to the Executive Board. At the expiration of his term of office he shall account for and turn over to his successor in office all money, vouchers, and account books belonging to the Association.

The Treasurer shall pay out moneys only on vouchers countersigned by the President and Secretary, or president and Editor, excepting minor expenses of the Secretary, and such revolving fund allowances as may be placed at the disposal of the Editor and Manager of the Journal by the Budget Committee.

The Treasurer shall at the expiration of each fiscal year make a detailed statement, accompanied by vouchers, covering all receipts and expenditures to the Executive Board and the report shall be published in the official Journal.

Executive Board

Section 7, A now reads as follows:

The Executive Board shall consist of seven members, one from each Executive Board district, and one member-at-large, and it shall elect annually its own chairman.

Proposed to be amended to read as follows:

The Executive Board shall consist of fourteen members, as follows:—The President, six Vice-Presidents, one member from each Executive Board district, as hereinafter provided, and one member-at-large. This Board shall annually elect its own chairman.

Section 7, B now reads as follows:

Each member of the Executive Board shall hold office for five years, except the district members first elected under this Constitution. Those first elected from the First, Second, Third, Fourth and Fifth Districts shall hold office respectively for one, two, three, four and five years from the date of election.

Proposed to be amended to read as follows:

Each member of the Executive Board shall hold office for five years, except the President and six Vice-Presidents, who shall hold office for one year.

Section 7, E now reads as follows:

The Executive Board shall pass upon the eligibility of all candidates for membership and report their recommendations to the Association. Four members of the Executive Board shall constitute a quorum for the transaction of business.

Proposed to be amended to read as follows:

The Executive Board shall pass upon the eligibility of all applicants for membership except as hereinafter provided and report their recommendations to the Association. Eight members of the Executive Board shall constitute a quorum.

Section 7, H now reads as follows:

Accurate records shall be kept by the Secretary of the Association of all meetings of the Executive Board.

Proposed to be amended to read as follows:

The Secretary of the Association shall keep accurate records of all meetings of the Executive Board.

Section 7, M now reads as follows:

The Executive Board shall have the Journal accounts audited by a qualified accountant annually or oftener if deemed necessary, and submit annually to the Association a financial statement including inventory.

Proposed to be amended to read as follows:

The Executive Board shall have the accounts of the Secretary, the Editor and Business Manager of the Journal and the Treasurer, audited by a qualified ancountant annually or oftener if deemed necessary, and submit annually to the Association a financial statement including inventory.

Vacancies and Removals

Section 9, third paragraph, now reads as follows:

Vacancies in the office of the Secretary or Treasurer shall be filled by appointment for the unexpired term by the President.

Proposed to be amended to read as follows:

A vacancy in the office of Treasurer shall be filled by appointment for the unexpired term, by the President.

Proposed that a paragraph be added to read as follows:

In the event of the absence of a member of the Executive Board at a regular or special meeting, the President may appoint a member to fill such vacancy, the temporary appointee, in each case, to be from the same district as the absentee.

Executive Board Meetings

Section 10, third line, now reads as follows:

Special meetings may be called by the Secretary upon written request of five members of the Executive Board.

Proposed to be amended to read as follows:

Special meetings may be called by the Secretary upon written request of ten members of the Executive Board.

BY-LAWS

Article 2—Application for Membership.

Section 6 now reads as follows:

All candidates for membership reported to the Association by the Executive Board shall be ballotted upon and a three-fourths vote in the applicant's favor will entitle him to active membership.

Proposed to be amended to read as follows:

Applications for membership shall be made upon blanks furnished by the Association, in the handwriting of the applicant, and must be endorsed by two members of the Association in good standing, one of whom must be a resident of the state, province or territory in which the applicant resides. Applications must be accompanied by the membership fee of $5.00 and dues pro rata for the balance of the fiscal year current, as stated on the application blank. Applications must be filed with the Secretary and be examined by him for correctness and completeness as far as available information will allow. After such approval by the Secretary, the latter will cause to be published in the official Journal, as soon thereafter as possible, said application with name and address of applicant, college and year of graduation, and names of vouchers. If no objections shall be filed with the Secretary, as against the applicant being admitted to membership in the Association, his name shall again be listed in the next issue of the Journal, and if no objections shall have been filed within thirty days after the second publication of the name of the applicant, he shall automatically become a member and shall be so enrolled by the Secretary, and membership card issued. If any objections be filed against any applicant, either on first or second notice, said application will be referred to the Executive Board for consideration.

Article 5—Dues

Section 1 now reads as follows:

There shall be an initiation fee of five dollars ($5.00). The annual dues shall be five dollars ($5.00), payable in advance on the first day of September. Honorary members shall pay no dues.

Proposed to be amended as follows:

Change word "September" to read "January".

Article 8—Nominations.

Section 1 now reads as follows:

Nominations for office, except as otherwise provided for, shall be made orally. A nominating speech shall not exceed two minutes and the nominations shall not be closed until every member present has had an opportunity to present his candidate.

Proposed that another section (2) be added to read as follows:

Nominations for President and Vice-President shall be made at the regular annual meeting, one year preceding the time of their assuming office. The names of the nominees for President and Vice-Presidents shall be published in the issue of the Journal following the regular annual meeting.

Article 9—Election of Officers.

Section 1 now reads as follows:

A majority of all votes cast shall be necessary to elect. If no nominee receives a majority of the votes on the first ballot, the nominee who receives the lowest number of votes shall be dropped and a new ballot shall be taken, and so on until a nominee receives a majority.

(No change proposed).

Section 2 now reads as follows:

The officers of the Association shall be elected at the afternoon session the second day of the annual meeting.

Proposed to be amended to read as follows:

The Treasurer and member-at-large of the Executive Board shall be elected at the afternoon session of the second day of the meeting.

Proposed that another section (3) be added to read as follows:

The President and six Vice-Presidents shall be elected by mail ballot. Within fifteen days after the publication of the names of the nominees in the Journal the Secretary shall mail a ballot to each member of the Association.

Article 11—Installation

Section 1 now reads as follows:

The officers of the Association shall assume their duties at the close of the annual meeting at which they are elected.

Proposed to be amended to read as follows:

The President and Vice-Presidents shall assume their duties at the close of the annual meeting following their election.

Proposed that another section (2) be added to read as follows:

The member-at-large of the Executive Board shall assume his duties at the close of the annual meeting at which he was elected.

ARTICLE 15—REGISTRATION

Section 1 now reads as follows:

No member may vote at a regular meeting until he has registered and paid his entire indebtedness to the Association.

Proposed to be amended to read as follows:

No member may vote at any election until he shall have paid his entire indebtedness to the Association.

Proposed that another section (2) be added to read as follows:

Each member shall designate to which section he wishes to be affiliated when registering at the annual meeting.

ARTICLE 17—STANDING COMMITTEES

Delete '6 Audit' from line 5. (This merely dispenses with an Audit Committee.)

EXECUTIVE BOARD ELECTION IN DISTRICT No. 1

The polls for nominations for Member of the Executive Board of the A. V. M. A. for District No. 1 (Canada) were closed on February 12, 1923. The names of thirteen different Canadian veterinarians appeared upon the nominating ballots. The five members standing at the head of the list, as shown by a careful count, were Drs. J. C. Hargrave, George Hilton, C. D. McGilvray, J. B. Still and E. A. Watson. These names were placed upon the election ballot, which was mailed to every member of the Association in District No. 1 who was in good standing on February, 12, 1923. Nominating ballots were examined and counted by a committee consisting of Drs. S. Brenton, E. P. Schaffter and H. Preston Hoskins, Secretary.

A number of the Quaker City Veterinarians take an active interest in the transactions of the Philadelphia Pathological Society. The December meeting of the Society was held at the University of Pennsylvania School of Veterinary Medicine, and the program included addresses on "Avian Tuberculosis", by Dr. Evan L. Stubbs, "Cow Pox", by Dr. Fred Boerner, and "The Life History of the Ascaris", by Dr. B. M. Underhill. All of the addresses were illustrated with lantern slides.

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the February* JOURNAL.)

TUESDAY MORNING, AUGUST 22, 1922

The first session of the Section on Sanitary Science and Police was called to order at nine-thirty o'clock by Dr. R. C. Reed, Chairman, of College Park, Md.

CHAIRMAN REED: The meeting will come to order. I will call upon the Secretary for his report.

(Dr. H. Preston Hoskins, of Detroit, Mich., presented the report of the Secretary, as follows:)

SECRETARY'S REPORT, ST. LOUIS, MO., AUGUST 28, 1922

H. PRESTON HOSKINS, Detroit, Mich.

More difficulties were experienced this year in getting papers for the program than in any of the four previous years that I have served as secretary of the section. The reason for this is not apparent. Quite a considerable number of our members who have been regular attendants at sessions of this section, and who have consistently taken part in our programs, advised your secretary that they did not expect to attend the meeting or declined to contribute to the program for various reasons. Little success has attended our efforts to get the younger members interested, to the point of presenting papers.

Before any definite plans for the program were made, early in the year, an effort was made to arrange a meeting of the section officers, so that the section programs might be discussed and the ground gone over, with a view to avoiding duplication of effort, getting better allocation of papers and subjects, and securing more attractive section programs. Experience gained from recent years pointed to the desirability of such a conference to get coordination of the section programs. This is particularly true of the Sections on Education and Research and Sanitary Science and Police, where there has been some tendency for programs to overlap. However, this is not to be construed as saying that the Section on General Practice should not be considered in any such plan. To make a long story short, it was found that the conference could not be held, as there were no funds available to defray the expenses of the section officers who would have to travel to attend such a conference. Therefore, it seems desirable to recommend that the Association make provision for doing this in the future.

In June, letters were sent to about seventy members of the Association interested in sanitary control work, asking for contributions or suggestions for the program. Replies were received from about one-third of those written. These replies clearly indicated that the subject of tuberculosis eradication, including tuberculin testing, is uppermost in the minds of a large number of our veterinarians, and there was a very evident desire upon their part to have various phases of the subject discussed, even though the ground has been covered so often at recent meetings of this Association, meetings of State and Sectional associations, tuberculosis conferences, short courses and other similar gatherings.

The proposal was made to have a session of this section on one of the two days when the clinics are being held in East St. Louis. This proposal was put up to the seventy members sent the letters before mentioned, for an

expression of opinion. Those in favor of the proposal out-numbered those opposed at least two to one, but upon more closely analyzing the replies, and weighing the pros and cons, it appeared that stronger arguments were put forth against the proposal than for it. On the whole, it appeared unwise to do anything that might detract from the interest in the clinics at East St. Louis, in view of the fact that the program was largely to be for the practitioners and that the meeting was really being built up around this idea.

Plans were made for the two sessions, as usual, and the papers promised divided into two groups. Examination of the official program shows that the second session of this section is scheduled for Friday afternoon, at 1:30 P. M., at a time when a general session is also scheduled. It might be well, before this session is adjourned, to decide whether the members wish to make any change in the program as printed. It is not quite clear how there could be a general session of the Association, simultaneously with sessions of the three sections, as scheduled for Friday afternoon.

Moved by Dr. Cahill that the Secretary's report be accepted. Motion seconded and carried.

CHAIRMAN REED: We will now hear the first address on our program this morning, "Observations on the So-Called Hog 'Flu'," by Drs. M. Dorset, C. N. McBryde and W. B. Niles, Biochemic Division, Bureau of Animal Industry, Washington, D. C.

(The paper was read by Dr. Niles. Paper and discussion published in Journal, November 1922, pp. 162-171.)

CHAIRMAN REED: We will take up the next paper, "Equine Infectious Anemia," by Captain R. A. Kelser, of the Army Medical School, Washington, D. C.

(Captain Kelser read his paper which was illustrated with numerous splendid lantern slides. Applause. Paper and discussion published in Journal, December 1922, pp. 319-331.)

CHAIRMAN REED: If there is no further discussion, we will take up the next paper on the program, which I think Captain Kelser has.

CAPTAIN KELSER: Mr. Chairman, if there is no objection, owing to the lateness of the hour and one more paper, I move that this paper be read by title and published; unless there is some particular reason for reading it, I move that it be read by title and published in the Journal.

Motion seconded by Dr. Cameron.

CHAIRMAN REED: It is moved and seconded that the third paper, "The Control of Equine Infectious Abortion in the U. S. Army," by Captains G. H. Koon and R. A. Kelser, Veterinary Corps, United States Army, be read by title and published in the proceedings. Are you ready for the question?

Question called, motion put and carried.

(Paper published in Journal, November 1922, pp. 193-196).

CHAIRMAN REED: We will pass on to the next paper, "The Value of Animal Experimentation to Veterinary Medicine," by Drs. J. G. Hardenbergh and S. D. Brimhall.

DR. HARDENBERGH: I am a little bit doubtful about presenting a paper of this character before this session. However, Dr. Hoskins was good enough to put me on this program and I hope you will bear with me for the few minutes that it will take to read this paper.

(Dr Hardenbergh presented paper. Applause. Paper published in Journal, this issue, pp. 731-735.)

CHAIRMAN REED: This very interesting paper of Dr. Hardenbergh is now open for discussion. I do not know that it needs much discussion, as it has been very ably handled, but it is of great importance and is interesting to all of us. Has anyone anything to ask?

DR. HOSKINS: I have been asked to announce that the Ohio State University Alumni will have their dinner at six p.m. in Parlor "F"; and the University of Pennsylvania Alumni will meet at six o'clock this evening. They are requested to assemble in the lobby of this hotel at a quarter to six.

CHAIRMAN REED: Now gentlemen, before we close this session, as the Secretary mentioned in his report, it is up to you to decide whether we shall have the session which is now scheduled for Friday afternoon on some other morning or afternoon of the week, or whether it shall be left on the program as it is now scheduled. It seems rather an impossibility to schedule a general session of the whole Association and three sections at the same time.

CAPTAIN KELSER: I believe if there is another period where this Friday afternoon session can be placed, it would be the thing to do, rather than have the two sessions conflict. Possibly Dr. Hoskins is more familiar with the program, also these clinics, and may be able to suggest a period where this could be placed.

DR. HOSKINS: I really have no information on which to base a suggestion as to just what is the best thing to do. It would hinge, in part, upon what the other sections have decided to do, because they are in the same boat that we are. Dr. Kinsley has pushed the program of the general sessions ahead, so that they are considerably ahead of the schedule at the present time, and it may be that they can clean up things so that it would not be

necessary to have a general session on Friday afternoon, although that would be very unusual.

CHAIRMAN REED: I think it would be very unfortunate for a very large proportion of the interested workers in the Association to be absent from a general session which would have important business to bring up.

DR HOSKINS: Mr. Chairman, I believe it would be desirable to let the thing hang fire for the time being, and the officers of this section can get in communication with the officers of the other sections and decide on something and have it announced at a general session.

CHAIRMAN REED: That would be a solution of the problem and we will take it up on that plan.

DR. CAMERON: I move we adjourn.

Motion seconded by Captain Kelser and carried.

ADJOURNMENT

FRIDAY MORNING SEPTEMBER 1, 1922.

The second session convened at 8:45 o'clock, Dr. Reed presiding.

CHAIRMAN REED: The meeting will come to order, please. The first and only paper that we will have this morning is by Dr. J. W. Connaway, of Columbia, Missouri. He needs no introduction. He will give us his paper on "Facts and Interpretations Relating to Infectious Abortion in Cattle and Swine".

(Dr. Connaway read his paper entitled, "Facts and Interpretations Relating to Infectious abortion in Cattle and Swine." Applause. Paper and discussion published in Journal, this issue, pp. 719-730.)

CHAIRMAN REED: If there is no further discussion, we will proceed to the election of officers for the coming year, which is the last item on our program.

Are there any nominations for chairman of the section?

DR. KELSER: I nominate the present incumbent, as Chairman of the Section on Sanitary Science and Police for the ensuing year.

DR. CONNAWAY: I second the nomination.

DR. KIERNAN: I move the nominations be closed.

The motion was seconded and carried.

DR. CONNAWAY: I move that the Secretary be instructed

to cast the unanimous vote of the Association for the present incumbent.

Dr. Hoskins being absent, Dr. Kiernan cast the ballot of the Association for Dr. Reed for Chairman.

CHAIRMAN REED: Gentlemen, as I told you in the beginning I am not a speech-maker and I am not going to inflict one on you now, but I hope since I have had one year's experience in the Chair I will be able to do a little better next year than I did this. I promise you to put my heart and soul into the work, and do all possible for the Section, and this Section is a mighty important one.

The only other officer to be elected at this time is a secretary. Now, of course, our present secretary is automatically barred. He has done admirably for several years. We shall be obliged to give some one else a chance. Now, nominations are in order for the office of secretary.

DR. KIERNAN: Inasmuch as we are going to Canada for the meeting next year, I want to nominate Dr. Hall, of the Canadian force, as Secretary. He is on Dr. Torrance's force up there.

DR. CONNAWAY: I second it.

DR. HART: I move the nominations be closed.

The motion was seconded and carried.

DR. HART: I move the President cast the unanimous vote of the Association for Dr. Hall, of Canada.

The motion was seconded and carried,

CHAIRMAN REED: The ballot is hereby cast. Dr. Hall is declared elected unanimously. So far as I know that concludes the work for this Section.

A motion to adjourn was seconded and carried.

ADJOURNMENT

Dr. R. C. Dayton, who has been engaged in general practice at Indiana, Pa., has accepted a position as dairy inspector with the Supplee-Wills-Jones Co., of Philadelphia, Pa. Dr. Dayton is stationed at Duncannon, Pa.

Dr. O. B. Morgan has removed from Rocky Ford, Colo., to Canton, Kan., where he has purchased the practice of Dr. F. H. Sharp.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. Robt. S. MacKellar, in the New York Academy of Medicine, 17 West 43rd St., on Wednesday evening, December 6th. 1922, at 8:30 p.m. The minutes of the November meeting were read and approved.

A round-table talk on "Rabies" was led by Dr. Geo. Goubeaud, who ably discussed and brought out many excellent points in arriving at a correct diagnosis of this dread disease. He pointed out the immense services veterinarians may perform in conserving public health by advocating the vaccination of all dogs against rabies. He said the Department of Health was considering passing an ordinance making the vaccination against rabies of all dogs, in New York, a section of the Sanitary Code. Drs. Slawson, Berns, Chase, Miller, Rohrer, Major Jewell and others joined in a general discussion.

Dr. Berns proposed the following resolution:

WHEREAS, many of our members report the gratifying results of immunizing dogs against rabies by vaccination, be it

RESOLVED, that this Association fully endorse this method and firmly believe that it would be greatly to the interest of public health if the vaccination of all dogs against rabies was made compulsory, and be it further

RESOLVED, that a copy of this resolution be sent to the New York Department of Health for its consideration.

This resolution was duly seconded and carried.

Dr. Raymond J. Garbutt was unanimously elected to become a member of this association.

The amending of Section 1, Article 8, of our by-laws, making the annual dues $5.00, payable in advance, as proposed at our last meeting, the necessary two-weeks notice having been given the members, was taken up for final action and was passed unanimously.

Dr. Chase moved that we hold our meeting in the New York Academy of Medicine, as the best located and most accessible to the great majority of our members. This was seconded and carried.

This being the annual meeting, the reports of all committees and election of officers were in order.

The Chairman, Dr. Reid Blair, of the Program Committee, being absent, Dr. Berns reported progress. Dr. McKinney,

Chairman of the Prosecuting Committee, reported progress. The accounts of the Secretary-Treasurer, having been audited by the Auditing Committee, showed a balance in the treasury.

The election of officers for the ensuing year then took place, and resulted as follows:—Dr. J. Elliott Crawford was unanimously elected President. Dr. Bruce Blair was unanimously elected Vice-President. Dr. C. G. Rohrer was unanimously elected Secretary-Treasurer.

The following five members were unanimously elected to serve as Censors:—Dr. Chas. E. Clayton, Chairman; Dr. Geo. J. Goubeaud, Dr. Wm. J. McKinney, Dr. E. A. Durner, and Dr. Alex. Slawson.

A vote of thanks was extended to Dr. Goubeaud. Meeting adjourned..

J. Elliott Crawford, *Secretary*

DELAWARE VETERINARY MEDICAL ASSOCIATION AND UNIVERSITY OF DELAWARE VETERINARY CONFERENCE

The Association held its annual meeting in conjunction with the University of Delaware Veterinary Conference on December 21, 1922.

Dean C. A. McCue, of the Agricultural School, welcomed the guests to the University. He talked on the growth of the live stock industry in the state and the relation of the veterinarian to this important branch of agriculture. Of special interest to the members present was the news of the rapid progress being made within the State in the swine, dairy and poultry industries. Dean McCue stated that Delaware is the only State east of the corn belt producing an excess of corn, and that it is the extension policy of the University to advocate the feeding of corn to swine, rather than exporting this crop. He further stated that the poultry industry in the State is growing by leaps and bounds and with this growth there is arising both a need and a demand for investigational work on poultry-raising problems and especially those of a disease nature.

Dr. C. C. Palmer, of the Department of Animal Industry, discussed the work of this Department, especially with reference to the research being done in animal diseases. The members were keenly interested in the feeding experiments conducted on swine and the rations that were found practical for Delaware herds.

Drs. F. P. Ruhl, of Milford, and H. McDaniel, of Dover, led the round-table discussion on poultry diseases. Dr. Palmer gave a resume of the poultry diseases studied at the laboratory and Prof. H. R. Baker demonstrated the method of collecting a blood sample for conducting an agglutination test for white diarrhea. Dr. L. Levinson, of Middletown, told of the value to be derived from intestinal antiseptics in treating poultry diseases.

The question of veterinary fees was dealt with in considerable detail, the discussion being led by Drs. Ruhl and Eves. The consensus of opinion seemed to be that the question of fees is largely a local matter and is best determined by the individual practitioner and governed by local conditions.

Dr. R. O. Biltz, of Georgetown, recently appointed field man for the State Board of Agriculture, on Tuberculosis Eradication, gave a talk on Tuberculosis Control work in the Lower Counties.

Dr. M. L. Zurkow, B. A. I. Veterinarian in charge of Hog Cholera Control, scheduled to talk on Hog Cholera, was unable to attend the Conference. His place was taken by Dr. Ruhl, who talked of his experiences in vaccinating swine.

The Association voted to hold its annual meeting in conjunction with the University Conference. New Association officers elected were President, Dr. Harry McDaniel, Dover; Secretary-Treasurer, Dr. C. C. Palmer, Newark; Members of the Executive Committee, Drs. Ruhl of Milford, McDowell of Middletown and Eves of Wilmington.

Dr. Ruhl invited the Association to hold its summer meeting at Rehoboth, Delaware's leading ocean resort, as his guests. The invitation was accepted.

C. C. Palmer, *Secretary.*

VETERINARY PRACTITIONERS' WEEK, UNIVERSITY OF CALIFORNIA

The recent Veterinary Practitioners' Week, held at the University Farm at Davis, California, January 2 to 5, 1923, was a very successful meeting. There was a larger attendance than at any of the short courses which have been held annually since the year 1916. One-hundred and forty-five men were registered. As there are about three hundred active veterinarians in California, this is considered a very good representation.

Doctor W. E. Muldoon, of Kansas, and Doctors A. Eichhorn

and J. F. DeVine, of New York, were the principal lecturers at the course.

Doctor Muldoon touched on a variety of topics which his wide experience enabled him to handle in a very successful manner. His discussion of the subject of general therapeutics with the lecture on the external and internal administration of drugs was timely and enlightening, and was the first time this subject has been presented at the short courses. His operation of intestinal anastomosis and gastrotomy in the dog were skillfully performed and brought out new facts to a majority of the veterinarians as to the best method of performing these operations. His lecture on lameness in the horse and the surgical clinic on the horse were of great interest to a great majority of the attending veterinarians. Despite the reduction in horse practice, all the men not specializing in small animal practice still have a considerable amount of work on the diseases of horses.

Doctor DeVine's lectures on the diagnosis of pregnancy and treatment of sterility in the cow and mare were especially well received. Given in his very practical style, the practicing veterinarian obtained a maximum benefit and the discussions that took place were entered into by a high percentage of the practitioners and extended beyond the regular allotted time for the work. In his final lecture on business methods in practice, its organization and management, a masterful presentation of this subject was given and his closing remarks will undoubtedly long be remembered by the California veterinarians.

Doctor Eichhorn's opening lecture on rabies, its prevention and control, touched a problem of great importance in a number of sections of California at this time and was of great value in clearing up mooted questions regarding this disease which the practitioners and officials have been repeatedly facing for the past year in this state. His observations on the veterinary profession in Europe during his recent extensive travel through that country brought down to the minute the latest research in all of the major infectious diseases of animals. In the lecture on biological methods for the control of anthrax, a subject of annual importance to the live stock interests of California, Doctor Eichhorn discussed in a clear and forceful manner some recent developments and the newer ideas in regard to the many questions covering the exact method of treatment and procedure of handling this disease.

On account of the attention given to small animal practice the men engaged in this work were well represented and the symposium given during the first evening, under the direction of Dr. Muldoon, assisted by Drs. O. A. Longley, O. J. Kron, W. A. Boucher, and D. F. Fox, practicing veterinarians of California, brought out facts of importance in this field.

One afternoon was devoted to matters coming under the supervision of the State Bureau of Animal Industry. The subject of uniformity of methods of tuberculin-testing, by Dr. J. P. Iverson, Chief of the State Bureau of Animal Industry, and the policies and methods of enforcing the State dairy law, by Dr. J. Frey, with a similar talk by Dr. M. Rosenberger, on enforcing the meat inspection law, followed by a discussion of the influence of diet on swine diseases, by Dr. Robert Jay, the Federal cooperating agent, together with a moving picture, "Exit Ascaris," from the United States Bureau of Animal Industry, gave the practicing veterinarians an insight into the work of the official veterinarians of this state.

The latest work on "Red Water" was presented by Drs. E. Records and L. R. Vawter, of Nevada. This disease continues to be a baffling problem and is a matter of equal importance to California and Nevada.

A special lecture on estrous cycle studies and the relationship of diet to fertilization, covering extensive nutritional work done by Drs. Evans and Bishop, of the Division of Anatomy, of the University of California Medical School, was one of the features of the program. The work of these scientists has attracted national attention and while it has been largely confined to the white rat, it has clearly opened the possibility of interest and application to the breeding difficulties of all domestic animals.

During one evening the members of the Division of Veterinary Science occupied the time with a symposium on infectious abortion, followed by a discussion by Drs. DeVine and Eichhorn.

The meeting closed Friday afternoon, with surgical operations on the horse by Dr. Muldoon, assisted by Drs. McKenna and Carr, and there was a general feeling that the practitioners had been well repaid for attending the course and that they were greatly indebted to the visiting lecturers who contributed so much to the success of the week.

F. M. Hayes.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

The seventeenth annual meeting of the Mississippi State Veterinary Medical Association was held in the City Hall, Clarksdale, Miss., January 8th and 9th, 1923. The meeting was called to order by the President, Dr. J. A. Barger, at 9 a.m. The President then introduced Rev. Macon C. Vick, who delivered the opening invocation.

In the absence of Hon. L. C. Franklin, Dr. Wm. L. Gates made the address of welcome. Dr. Tait Butler, of Memphis, Tenn., followed with the response and gave the Association some very wholesome advice on the requirements necessary for the veterinarian of the future to be successful. He cited the fact that the tractor and automobile are here to stay, both in the city and in the country, and the veterinarian of the future must be a man of broader understanding and be equal to the members of other professions socially, intellectually and culturally. Following Dr. Butler, an excellent paper on "Glanders" was presented by Dr. M. J. Luster, of Clarksdale, which was well gotten up and well received by the Association. Those taking part in the discussion of this paper were Drs. D. F. Luckey and E. H. Berry.

The paper prepared by Dr. N. S. Mayo, on "The Flavines", was read by the secretary. A short discussion followed this paper and upon motion by Dr. Gates the Association directed the Secretary to write Dr. Mayo and thank him for his excellent paper. The subject of "Black Tongue" in dogs was presented by Dr. O. M. Norton, of Greenville, and brought out quite a lively discussion.

The afternoon session was opened by Dr. C. G. Stallworth, who gave a short address on Veterinary Publicity. Following this the Association had the pleasure of hearing Dr. L. A. Merillat discuss "The Horse Situation in America." He urged the profession to stand by the horse, because this animal, more than any one thing, made the veterinary profession. Dr. J. T. Alston read a well prepared paper on "Cattle Practice" which was followed by a short discussion.

In the absence of Dr. C. E. Salsbery, Dr. L. A. Merillat conducted the round-table discussion, which covered the following subjects: "Swamp Fever", by Dr. O. M. Norton; "Laminitis", by Dr. F. J. Douglass; "Tests for Tuberculosis", by Dr. D. F. Luckey. Drs. Drach and Wilson also made some remarks on the tuberculin tests. The prevalence of intestinal parasites in

the South was discussed by Dr. Tait Butler, and the "Status of Tick Eradication in Mississippi", by Drs. J. A. Barger and H. Chadwick. Dr. I. W. Edwards followed the round-table discussion with a talk on "Foot Troubles in Horses and Mules", the cause of which he attributes to ground infection.

The banquet held at the Alcazar Hotel at 8 p. m., was featured by an illustrated lecture by Dr. D. F. Luckey, of the St. Louis Live Stock Exchange.

Tuesday morning a general clinic was held at the hospital of Dr. W. L. Gates. Dr. L. A. Merillat performed several interesting operations on large animals, the most important of which was the roaring operation on a large mule. Drs. J. A. Beavers, O. M. Norton, E. S. Norton, F. J. Douglass, W. L. Gates and others took part in the clinic. Dr. A. C. Drach, of Omaha, Nebraska, made three post-mortems on virus pigs, which made a very interesting demonstration of the lesions produced by hog cholera virus.

The election of officers resulted in Dr. I. W. Edwards, of Vicksburg, Miss., being elected President; Dr. John Oliver, Columbus, Miss., 1st Vice-President; Dr. G. B. Bradshaw, Hattiesburg, Miss., 2nd Vice-President; and Dr. H. L. Fry, Jackson, Miss., Secretary-Treasurer. Grenada was selected for the next meeting, to be held January 1924.

H. L. Fry, *Secretary-Treasurer.*

WASHINGTON POST-GRADUATE COURSE FOR VETERINARIANS

A post-graduate course for veterinarians was offered by the College of Veterinary Science of the State College of Washington, at Pullman, January 9 to 12, 1923. The three-day program proved to be of great interest to the veterinarians of the Northwest, due largely to the fact that the principal lecturers were Dr. John F. DeVine, Goshen, N. Y., and Dr. Adolph Eichhorn, Pearl River, N. Y. In addition to these nationally prominent veterinarians, the program was well sustained by prominent local veterinarians of the Northwest, including Dr. H. A. Trippeer, Walla Walla; Dr. Peter Mackintosh, Yakima; Dr. L. C. Pelton, Deputy Commissioner of Dairy and Livestock for the State of Washington; Dr. A. R. Galbraith, Garfield; Dr. Otto Menig, Pullman; and Mr. J. L. St. John, Experiment Station Chemist, of Pullman.

Among the topics which were given a prominent place in the

lectures were the "Physiology and Anatomy of the Generative Organs of the Male and Female," "Abortion Disease in Cattle," "Results of Abortion Disease on the Maternal Genital Organs," "Abortion and Sterility in the Mare as Compared with that in the Cow," "Digestive Ailments of the Mother and Calf," "Demonstrations of the Method of Manipulating the Genital Organs of the Cow in the Treatment of Sterility." "Forage Poisoning in Animals," "Recent Developments in Nutrition," "Hepatic Cirrhosis (Walking Disease) in Horses," "Environment as Affecting Animal Health," and "The Prevention and Control of Rabies" also received attention.

The meeting was attended by forty veterinarians from the States of Washington, Oregon and Idaho and British Columbia. At the dinner given the last evening of the Course, talks were heard from representatives of these three States and British Columbia, all expressing their appreciation of the great good that this post-graduate course is doing for the veterinarians of the Northwest. Resolutions were passed, expressing the approval of the entire group and asking that, if possible, the Course should be given annually in the future.

E. E. Wegner,
Dean.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION

The twenty-sixth annual meeting of the Minnesota State Veterinary Medical Association was held at the Radisson Hotel, Minneapolis, Wednesday and Thursday, January 10th and 11th, 1923. The meeting was very well attended, approximately one hundred and seventy-five (175) veterinarians being registered.

The meeting was opened with the address of the President, Dr. W. L. Boyd, who spoke on the "Signs of the Times in Veterinary Medicine." Dr. Earl A. Hewitt, of University Farm, gave a comprehensive report on "Veterinary Education." Dr. J. P. Foster, of Minneapolis, reported for the Committee on Surgery. Dr. Foster read a paper in this connection, on the use of atropine and morphine for anesthetic purposes in small animals, this to be added to, as needed, by ether. Dr. F. L. Ober, of Duluth, read the report of the Committee on Medicine. Dr. W. A. Anderson, of Sleepy Eye, reported for the Stallion Registration Board.

Eight new members were voted in. The program as given below was carried out. In addition, on Wednesday evening, Dr. C. B. Shore, of Lake City, who is connected with the Rest

Island Silver Fox Co., gave a very interesting talk on the fox industry, and showed a film giving the important points in "The Raising of Silver Fox." Dr Shore pointed out that the fox industry was assuming great importance, and that fur farming in general was becoming a profitable industry.

PROGRAM

Business Methods in the Practice of Veterinary Medicine, Dr. J. N. Gould, Worthington, Minn.

The Differential Diagnosis of Cattle Diseases that Resemble each other Clinically, Dr. R. R. Dykstra, Manhattan, Kans.

Some of the Pitfalls and Mistakes as they Occur in Practice, Dr. J. X. Parent, Foley, Minnesota.

Address of Welcome, Mr. Geo. E. Leach, Mayor, Minneapolis, Minn.

Response for the Association, Dr. L. Hay, Faribault, Minn.

Address—The Relation between Livestock Husbandry and Veterinary Medicine, Senator H. H. Bonniwell, Hutchinson, Minn.

The Present Status of Knowledge Concerning Bovine Infectious Abortion, Dr. C. P. Fitch, St. Paul, Minn.

The Use of Glandular Extracts in Veterinary Medicine, Dr. J. F. Shigley, St. Paul, Minn.

Some Practical Points in Horse Practice, Dr. W. H. Welch, Lexington, Ill.

Diseases Affecting Small Pigs, Dr. A. T. Kinsley, Kansas City, Mo.

Rickets and Related Bone Diseases (Illustrated), Professor L. S. Palmer, University Farm, St. Paul.

Milk and Dairy Inspection from the Standpoint of the Practitioner of Veterinary Medicine, Dr. Cassius Way, New York City.

Following Dr. Way's paper, a discussion took place in regard to a bill before the Legislature, on the use of hog cholera virus by the farmer. It was felt by the profession that it was unwise to allow the distribution of hog cholera virus to the farmer. A committee was appointed to confer with the Agricultural Committee of the Senate and House in respect to this matter. Dr. D. B. Palmer, of Minneapolis, was appointed Chairman of this committee.

The following officers were elected for the ensuing year: R. J. Coffeen, Stillwater, President; R. L. West, Waseca, 1st Vice-

President; B. L. Cook, Farmington, 2nd Vice-President; C. P. Fitch, University Farm, St. Paul, Secretary-Treasurer. Board of Trustees: R. J. Coffeen, Stillwater; C. A. Nelson, Brainerd; Harry Evenson, Sacred Heart; D. I. Remington, Tracy; C. P. Fitch, University Farm.

C. P. Fitch, *Secretary.*

THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

The thirty-ninth annual meeting of the Veterinary Medical Association of New Jersey was held in the Stacy Trent Hotel, Trenton, N. J., Thursday, January 11th, President H. H. Bair presiding.

The roll-call showed a very good attendance, more numerous than the previous year. The Committee on Securing Enrollment in the O. R. C. of the U. S. Army urged more members to join, as the State has not filled her quota to date.

A communication from the Blue Cross Society caused considerable controversy. It was decided by a large, majority vote to take no action on this communication, the consensus of opinion seeming to be that veterinarians, being trained men of high standing, were capable of judging the advisability of anesthesia in each individual case. To form an anesthesia committee, or to urge legislation of this nature, would seem an action reflecting upon their ability and finer sense of feeling and sympathy with dumb animals.

Dr. William J. Lentz, Director of Small Animal Clinic, University of Pennsylvania, gave an excellent talk on "Canine Distemper." Among his remarks were the following excellent points:

"We are all much in the dark regarding the cause, and therefore regarding treatment.

"It is impossible to reproduce it by direct inoculation.

"The use of the term "distemper" is too general; we may have several diseases, or perhaps several forms, such as: (1) snuffles in puppies, or catarrhal fever; (2) contagious infections, bronchial catarrh, or 'kennel disease,' affecting all dogs of any age; (3) paratyphoid or enteric fever; (4) typhus, or 'Stuttgart' disease." Dr. Lentz outlined a thorough course of treatment for each variety of the disease, or each disease separately, as he is inclined to regard them.

Dr. F. A. Laird, State Veterinarian of Illinois, gave an excel-

lent talk on "Botulism." This proved to be a subject the doctors in the entire State are much interested in, and caused a great amount of discussion, due to the prevalent sporadic outbreaks, both in horses and chickens.

Dr. F. S. Jones, of the Rockefeller Institute for Medical Research, gave an illustrated talk on "Pneumonia in Cattle." This lecture was of more than local interest. It seems to be a disease carried by cattle shipped into New Jersey. Native cattle contract the disease when they come into direct contact with shipped cattle. Calves may carry it for years. Actual outbreaks have been recorded after a lapse of two years.

The annual dinner was enjoyed by all.

The following officers were elected for the year 1923: President, Dr. J. W. Haffer, of Paterson; 1st Vice-President, Dr. Peter Runyon, of Freehold; 2nd Vice-President, Dr. A. W. Smith, of Orange; Secretary, Dr. P. B. Silvester, of Princeton; Treasurer, Dr. H. Ticehurst, of Tenafly.

The thirty-ninth semi-annual meeting will be held at Asbury Park, July 12 and 13th, with headquarters at the Hotel Marlborough.

P. B. Silvester, *Secretary.*

THE FIFTEENTH ANNUAL CONFERENCE FOR VETERINARIANS AT CORNELL UNIVERSITY

The following program expresses concisely the character of the crowded two-day session held at the N. Y. State Veterinary College, January 11 and 12.

9:00 Veterinary Education in the United States, V. A. Moore.

9:15 Present Status of So-called Cotton-seed Poisoning, S. A. Goldberg. Discussed by L. A. Maynard, College of Agriculture.

10:00 The Rate of Passage of Food through the Digestive Tract, P. A. Fish.

10:45 Anatomy of Reproductive Organs, G. S. Hopkins.

11:30 Lead-poisoning in Calves, F. W. Andrews, Mt. Kisco, N. Y.

12:15 Intestinal Parasites of Small Animals, H. J. Milks.

1:00 Luncheon.

2:00 Influence of the Male in the Spread of Genital Infections (Illustrated), W. L. Williams.

2:45 The Relation of Colostrum to Immunity of Newborn Calves, J. Traum, University of California.

3:30 Septicemia Hemorrhagica with Special Reference to Cattle, E. A. Cahill, Indianapolis, Ind. Septicemia Hemorrhagica in Swine, J. W. Benner. Discussion by W. A. Hagan, E. V. Moore, G. E. Jorgenson, A. M. Mills.

Department of Physiology.

Demonstrations with dark-field microscope:—chylomicrons in the blood, galactomicrons in milk, spermatomicrons in semen.

Department of Anatomy.

Anatomical Specimens of Reproductive Organs of Cattle.

2:30 *Department of Medicine.*

Demonstrations. Medical Building.

(1) Physical Examination of Vagina and Cervix of Cow.
(2) Methods of Intravenous Injection of Drugs.

3:00 *Farriery.*

Demonstrations in Shoeing for Different Forms of Lameness.

2:30 *Small Animal Building.*

Demonstration of Intestinal Parasites in Dogs with Diagnosis and Treatment.

3:00 Small Animal Clinic.

3:00 Surgical Clinic, Large Animal Operating Room.
Demonstrations.

(1) Passing of Stomach Tube in Cattle.
(2) Dressing of Cases.

3:00 *Veterinary Experiment Station.*

Demonstrations in Medical Building.

(1) Methods of Confining Hogs.
(2) Specimens of Hog Cholera Lesions.

8:00 Address of Welcome, President Farrand.

8:30 Veterinarians in the Days of the Romans, Prof. C. L. Durham.

9:15 American Veterinary Medical Association, H. Preston Hoskins, Detroit, Mich.

9:30 Smoker, Veterinary College.

Friday, January, 12, 1923.

9:00 Natural and Artificial Immunity of Young Pigs to Hog Cholera, R. R. Birch.

9:30 Luxation of Coxo-femoral Articulation, J. N. Frost and Earl Sunderville.

10:00 Recent Developments in the Control of Animal Diseases, D. H. Udall.

10:30 Veterinary Inspection of Dairies Required by New York City, J. E. Thompson, New York City Board of Health.

11:15 Municipal Dairy and Meat Inspection, E. L. Volgenau, Buffalo, N. Y. Discussion opened by W G. Hollingworth, Utica, N. Y.

12:15 Alumni Meetings.

Demonstrations.

2:00 In James Law Hall, Second Floor, North Wing.

Department of Pathology and Bacteriology.

(1) Demonstrations of Arterio-sclerosis.
(2) Brain Lesions and Inflammation of Joints.
(3) Manufacture of Tuberculin and some Common Parasites of Animals.

6:30 Informal Dinner at Ithaca Hotel.

The Veterinary Practitioner in Animal Disease Control in New York, D. W. McLaury, Department of Farms and Markets, Albany, N. Y.

Private Practitioners in Tuberculosis Eradication, Chas. Linch, Department of Farms and Markets, Albany, N. Y.

The Disposition of Tuberculin Reacting Cows and their Milk, J. Traum.

New York State Veterinary Medical Association, W. Reid Blair, New York, N. Y.

Space will not permit of detailed comment on all of the papers further than to state that each was listened to with evident interest. It was apparently the purpose of the program to supply a variety of instructional, practical, economic and live topics that would benefit the practitioner and keep him in touch with the latest developements in matters pertaining to his profession.

Dean Moore, in his opening address on Veterinary Eduction in the United States, stressed some of the problems that confront the profession and live stock interests of the country. He

gave statistics showing the decreased attendance at the veterinary schools, the alarming drop in the number of graduates since the war, referred to some of the probable causes and emphasized strongly the fact that the need for trained veterinary service was never greater than at the present time.

The paper of Dr. Milks, on Intestinal Parasites of Small Animals, was ably discussed by Dr. F. H. Miller, of New York, who from his long, extensive and varied experience added information of much value to the points brought out by Dr. Milks.

The papers at the afternoon session by Doctors Williams, Traum, Cahill and Benner, in addition to their educational worth, contained much of practical value to the listeners. The discussion on septicemia hemorrhagica was lively and participated in by many of the audience. As the disease exists in New York State, it apparently presents numerous difficulties in diagnosis and treatment. It was made clear that much more effort is needed to solve the obscure problems standing in the way of a complete understanding of the disorder.

At the evening session President Farrand, of the University, extended a cordial address of welcome. He spoke of the importance of veterinary work to the economic interests of the country; the high ideals that point toward success and the value of honest service.

Professor Durham, of the Latin Department, in a most interesting manner, touched upon some of the early superstitions pertaining to the veterinary art and pointed out that in ancient times there was a distinct recognition of veterinary service and that the trials and vicissitudes of the *mulo-medicus* were not unlike those of the veterinarian of today. His translations from the works of Vegetius, of the fourth century, showed that this writer possessed high ideals and a keen appreciation of ethics, which present leaders in the profession might do well to emulate.

Dr. Hoskins, the newly appointed Secretary and Editor of the JOURNAL of the A. V. M. A., discussed in a frank and open way the present situation of the Association. The effort to strengthen the practitioners' influence must come from themselves. He urged that all who were eligible should join and participate in the benefits that would result. He asked for assistance and co-operation, promising on his part the maximum of effort to bring about the success so earnestly desired.

In opening his paper Dr. Udall referred to politics as one of the "Recent Developments in the Control of Animal Diseases."

He then presented considerable statistical and therapeutic information relative to a number of interesting cases encountered in the ambulatory clinic.

On account of the absence of the author, Mr. Daugherty, of the New York City Board of Health, presented Mr. Thompson's paper on "Veterinary Inspection of Dairies Required by New York City."

This paper brought out a lively discussion which was participated in by many of the veterinarians and representatives of the Board. The resulting effect seemed to indicate that the atmosphere had been cleared to some extent and that numerous difficulties were in a fair way of being solved by a more complete understanding of the issues involved.

After a light luncheon at the College, in order to conserve time, the remainder of the afternoon was devoted to the various demonstrations and exhibits which had been arranged. The final session of the Conference was held at an informal evening dinner at the Ithaca Hotel. President Blair, after some preliminary remarks on the State Veterinary Society, gave a highly interesting address upon the zoological ancestors of the domesticated animals.

Mr. McLaury, of the Department of Farms and Markets, urged community breeding and the use of better animals and stated that 8000 out of 25000 reactors had been tested by practitioners. He expressed a desire to cooperate with the practitioners. Dr. Linch pointed out that the 20 official veterinarians in the State were unable to cope with the situation and implied that the services of 300 practitioners on the accredited list might be invoked.

Commissioner Pyrke, of the Department of Farms and Markets, spoke frankly of the difficulties which confronted him on assuming office 18 months ago, and of difficulties which remained. He expressed some degree of optimism as to the result and hoped that by next year one third of the cattle in the state would be under supervision. Doctors Moore and Udall took part in the discussion and championed the cause of the practitioners.

Dr. Traum, of the University of California, closed the session with an interesting account of how tuberculin-reacting cows and their milk were disposed of in California.

P. A. F.

IOWA VETERINARY ASSOCIATION

The thirty-fifth annual meeting of the Iowa Veterinary Association, held at Des Moines, Jan. 16-18, was thought by all attending to be one of the best meetings ever held. An attendance of over 400, together with the keen interest taken in the papers and discussions, made it successful. Visitors remarked that this meeting was the largest they had attended in any state. The practitioners took a very active part in the program. The Veterinary Division of Iowa State College, at Ames, gave a one-day short course for practitioners, which was a sort of supplementary clinic to the meeting.

In his President's address, Dr. E. A. Buxton, of Vinton, Ia., referred to the present situation of the Iowa veterinarians as regards the hog cholera serum and virus law, and he pointed out the importance of the practitioner as an economic factor in the welfare of the live stock industry of the State, which represents $337,753,000. Dr. W. H. Welch, President of the American Veterinary Medical Association, addressed the convention on "The Horse" and he also spoke of some of the encouraging things the A. V. M. A. is planning on doing for the practitioner. The Fees Committee worked out a system of fees which was recommended as a guide and submitted to the Association.

Many good papers were presented concerning such subjects as forage poisoning of cattle, milk and dairy inspection, purpura hemorrhagica, technic in the use of local anesthetics, veterinary advertising, violations of the veterinary practice and live stock sanitary laws, bovine tuberculosis, poultry diseases, care of poultry, caponizing and swine diseases.

Dr. W. B. Niles, of the B. A. I., gave a very interesting talk on "Some Observations on Swine Diseases." Dr. C. P. Fitch, of the University of Minnesota, presented the subject of "the Presemt Status of Abortion Disease," in his usual forceful and instructive way. "Veterinary Conditions in Europe" was the title of an interesting talk by Dr. Adolph Eichhorn. A lecture illustrated by stereopticon and motion pictures, on "The Prevention of Live Stock Losses in Transit," was given by Dr. W. J. Embree, of Chicago. A wonderful picture entitled, "The Horse in Action," followed a splendid talk by Dr. L. A. Merillat on the horse situation. "Hormone Therapy" was presented by Dr. J. F. Shigley, of St. Paul, who brought out some of the experimental data on gland preparations.

The newly elected officers are as follows: President, Dr. John Patterson; First Vice-President, Dr. N. E. Gubser; Second Vice-President, J. C. Glen; Secretary-Treasurer, Dr. E. R. Steel; Executive Board (three years) Dr. J. S. Potter; (two years) Dr. R. J. Laird.

E. R. Steel, *Secretary-Treasurer.*

IOWA CONFERENCE FOR VETERINARIANS

The eighth annual Conference for Veterinarians was held at Ames, Iowa, Friday, January 19, 1923.

For the last three years these conferences have been given over largely to demonstration clinics and this year's program was presented in that manner. Dean Stange gave the visitors a cordial welcome in his opening remarks and presided over the meeting throughout the day.

The program started with the presentation of three live topics by Dr. W. F. Guard, viz: otitis media in animals, technique for the use of local anaesthetics, and an improved technique for the operation of umbilical hernia in male pigs. The subjects were all illustrated by carefully prepared specimens which showed exactly the structures involved and the methods used.

The subject of the cause, symptoms, diagnosis and treatment of otitis media in animals, as worked out by Dr. Guard during the last year, we believe, is a new contribution to veterinary literature and is of considerable economic importance. While it seems to be most common in swine, it has been diagnosed and treated in calves, dogs and cats. The technique for the use of local anaesthetics and for the hernia operation is the result of much careful study and holds the secrets for the success of the operations.

This was followed by a discussion of caponizing and a demonstration of the operation by Dr. John Patterson, of Hedrick, Iowa. Some good specimens of capons and slips were on exhibition and some of the birds were autopsied to show the position of the structures. The whole demonstration was most interesting and practical.

Just before noon, Dr. C. E. Juhl, of Osage, Iowa, demonstrated the use of the stomach tube in swine to the entire satisfaction, and one might well say, the amazement of those in attendance.

In the afternoon all assembled at the Pathology Laboratory,

where Dr. E. A. Benbrook, Head of the Department of Pathology, and members of his department demonstrated equipment and methods used in milk and food inspection work. Much interest was shown in this important phase of veterinary activity. Over two hundred cities and towns in Iowa now have some system of milk inspection.

Following this Professor H. A. Bittenbender, Head of Poultry Husbandry, lectured upon the various breeds of poultry, exhibited types, and demonstrated judging and culling poultry. Finally Dr. Chas. Murray and members of his department presented the subject of diseases of poultry and showed symptoms and lesions of the more common ones to be dealt with by the practitioner.

About two hundred practitioners were present and the interest in the day's work was greater than ever before. Many expressed the desire for a longer course or for more frequent courses. These courses are provided for by a special fund and the Veterinary faculty is anxious to provide what the practitioners of the state feel to be their greatest need.

H. E. Bemis, *Chairman*,
Practitioners' Course Committee.

KANSAS VETERINARY MEDICAL ASSOCIATION

The nineteenth annual meeting of the Kansas Veterinary Medical Association was held at Topeka, January 16-17, 1923. Headquarters were established at the Throop Hotel, and the program was given at the Chamber of Commerce rooms, with the exception of a clinic, which was put on in the Live Stock Pavillion, Kansas Free Fair grounds.

The program for the first day consisted of a number of addresses, literary numbers and discussions. The annual dinner was given at 6:30 in the spacious dining-room of the Chamber of Commerce, where nearly two hundred veterinarians, their ladies and guests partook of a good feed. This was followed by several able after-dinner speakers, members of the State Legislature and others.

The audience was then nicely entertained with special numbers by the Boys' Industrial School, the local Eastern Star ladies and Mrs. Maude Castren, of Topeka. Dr. J. H. Burt was the able toastmaster for the occasion. The tables and chairs were then pushed aside and the balance of the evening spent in dancing.

The forenoon of the second day was devoted to the reports of committees, election of officers, and reading and discussion of literary numbers. A splendid clinic was held in the afternoon, with an abundance and variety of material in charge of Drs. Young, Noller and Graefe, of Topeka.

At the election of officers the following were chosen for the ensuing year: Dr. S. L. Stewart, Olathe, President; Dr. I. J. Pierson, Lawrence, Sec'y-Treas.; Dr. Sam Hayes, Hutchinson, Member Executive Committee.

The Association will meet next January, at Manhattan, in the new $100,000 clinic building which is now under construction at the Kansas State Agricultural College and which will be dedicated about that time.

That this was the best meeting held in years was the sentiment expressed freely by those in attendance. Much credit for this is due the veterinarians of Topeka and vicinity, who early organized themselves into a temporary organization and with untiring efforts spared no means to help the officers in preparing and carrying out the program.

I. J. PIERSON, *Secretary-Treasurer*

COLORADO VETERINARY MEDICAL ASSOCIATION

The twentieth annual meeting of the Colorado Veterinary Medical Association which was held in Denver, January 17th and 18th, 1923, during the week of the National Western Stock Show, both in point of attendance and interest exhibited, seemed to augur well for the future of the profession in the State.

The report of the Legislative Committee was of special interest because the Legislature was then in session. Dr. Chas. G. Lamb, Chairman of the Committee, reported that a bill had been presented, having for its object the continuation of the cooperation between the State and the Federal Bureau of Animal Industry, in the eradication of tuberculosis. This bill provided only one important new feature, which was that special provision was made for area work. The bill asked for an appropriation of $75,000. Dr. Lamb also stated that a bill had been introduced, providing for abolishing the State Board of Veterinary Examiners. This bill was the outgrowth of a fight between an unlicensed practitioner and the State Board, which has been carried on for several years. It does not seem

probable at this time that it can receive any serious consideration at the hands of the Legislature.

The election of officers resulted as follows: C. C. Stewart, President; W. G. Blake, First Vice-President; F. F. Mendenhall, Second Vice-President; I. E. Newsom, Secretary-Treasurer; Executive Committee: W. B. McGuire, A. G. Wadleigh, Geo. H. Carr.

Dr. Geo. W. Stiles, Jr., Pathologist for the B. A. I., at Denver, read a paper in which he discussed the "Awns of Grasses as a Source of Loss in Livestock." He described particularly the three-awned grass, and some damages which it had caused in sheep, cattle and mules. He stated that not only did these awns get into the mouth, interfering with mastication, in the eyes, interfering with sight, and in the skin, but he also found the awns in the lungs, which set up a fatal pneumonia.

Dr. Floyd Cross, Assistant Pathologist at the Colorado Experiment Station, discussed some of the losses in feeding lambs, which had engaged the attention of the Station. He described a typical outbreak of hemorrhagic septicemia in which the bipolar organism was isolated from 32 out of 34 sheep examined. He went on from this to state that hemorrhagic septicemia usually appeared within the first two weeks after the lambs were placed in the lots, and that any outbreak of disease coming at a later period was most probably due to some other condition.

Dr. Cross stated that in the district around Fort Collins, where about a million sheep are fed each winter, the chief loss this past year had been from overeating of corn, these losses usually appearing well along in the feeding period, and when the animals are getting from a pound to a pound and a half of corn. On reduction of the grain ration, these losses were easily controlled, but it might prove difficult to fatten the lambs in the time desired, and still keep free from death loss. He also outlined two other diseases which had caused considerable trouble, but for which no adequate cause had been discovered. These were a profuse scouring, sometimes seen when lambs were first brought in and a pneumonia from which the bipolar organism could not be isolated.

"Interpretation of the Intradermal Test" was discussed by Dr. E. N. Stout, who has been doing the accredited herd work for the B. A. I., within the State. Dr. Stout described the needle which he uses, and also the method of administration of

the tuberculin. He said that any circumscribed hard nodule above "pea-size" was quite certain to indicate a positive reaction. There were, however, certain diffuse swellings of dough-like consistency that proved somewhat troublesome. It sometimes occurred, that while no considerable swelling could be determined by palpation, yet on examination of the two folds, the injected side would be found to be somewhat thicker than the other. Generally speaking, he thought these should be considered negative reactions. He found that such reactions were more common when it was necessary to make more than one puncture with the needle.

A resume of the last meeting of the U. S. Livestock Sanitary Association was given by Dr. Geo. H. Glover. Case reports were detailed by Drs. W. G. Blake, and Geo. W. Dickey.

Dr. Geo. H. Carr, of Brighton, gave a talk on the subject of "How Pure-Bred Pigs Pay." He stated that he had many clients who were unable, on their own initiative, to buy pure-bred pigs, but who really wanted to get into the pure-bred business. In such cases it is his custom to furnish them with a sow pig and the services of one of his own boars, for which he would retain title to the pig furnished and one of each litter produced. In this way he found that he not only increased his income, through the sale of pigs, but that he greatly assisted the community in raising a better class of hogs, and also increased his own practice, because clients were much more apt to call a veterinarian for a pure-bred animal than they would for a grade. It might be added that Dr. Carr has been particularly successful in aligning himself with the various breed associations in his county, thereby increasing the pure-bred livestock of the district, and incidentally his own services to the community.

Prof. C. I. Bray, Associate Professor of Animal Husbandry at the Colorado Agricultural College, discussed "The Importance of Mineral Matter in Preventing Disease." This paper was an excellent presentation of the whole subject of deficiency of minerals, in lessening the productivity and the resistance to disease, of the domesticated animals. He not only considered mineral deficiency in its relation to rickets, osteomalacia and osteoporosis, but also in its relation to pig paralysis, abortion, sterility and many other maladies. This paper was an excellent presentation of our knowledge on this new phase of animal nutrition.

Director Elmore Peterson, of the Extension Service of the University of Colorado, gave an excellent address on "The Business Side of a Profession." This was a very timely topic, inasmuch as veterinarians have found it especially necessary to pay more attention to the business side of their activities, because of the lessened ability of the farmer to pay for veterinary services. Prof. Peterson did not attempt to go into the details of the profession of a veterinarian, but rather outlined the broad principles of a professional business. He defined business as an exchange of commodities for a mutual profit, stressing especially the word *mutual*. He said that unless there were mutual profits, no business could continue.

Prof. Peterson also stated that the newer idea of salesmanship was not to sell goods but was to assist the buyer in purchasing. He stated that there was a wide difference between these two attitudes. He maintained that a veterinarian must be a salesman, no less than a clerk in a dry-goods store, but that his activities were necessarily conducted in a different manner. He stressed advertising as being quite essential to any profession, although he realized that professional advertising was done along quite different lines from that of the usual mercantile business.

Among the things which the speaker said a professional man should legitimately do in order to advertise, were to pay special attention to his own personal appearance, to his vehicle and to his office or hospital. He also pointed out that a professional man should align himself with all the agencies in his community, which tended to community betterment, and in this way could engage very effectively in legitimate advertising. Altogether his address put professional business upon a high and dignified plane and made a considerable impression upon those present.

"Corpus Luteum" was discussed by Dr. H. E. Kingman, Surgeon in the Veterinary School at the Colorado Agricultural College. Deviating from the usual plan, he neither read a paper nor made a talk, but gave each one present a chance to ask a question, the only limitation being that it should have some relation to the corpus luteum. The announcement that this was to be done was made some time previous to the discussion of the subject, so that each one present was prepared with his question. These questions he took up one by one and answered concisely and to the point. Altogether it seemed probable that more real information was gotten to the veterin-

arians present in this way than could have been done by the usual method, although it is realized that this method has its limitations.

Dr. I. E. Newsom, Pathologist at the Colorado Experiment Station, summarized the recent work on Contagious Abortion, particularly in its relation to the control of the disease on the range. He discussed the experiments which the Station has under way, with a view to controlling abortion in range animals. The two chief factors which were emphasized were the isolation of heifers, particularly during the winter time, when on feed, and the use of a live organism vaccine, preferably on those animals that had not aborted.

I. E. Newsom, *Secretary-Treasurer.*

OKLAHOMA VETERINARY MEDICAL ASSOCIATION

The regular semi-annual meeting of the Oklahoma Veterinary Medical Association was held in Oklahoma City, January 18 and 19. Dr. L. B. Barker was elected secretary to fill out the unexpired term of Dr. T. O. Booth.

Dr. Guberlet, of the A. & M. College, at Stillwater, presented a very interesting and instructive paper on Poultry Diseases. The subjects of coccidiosis, aspergillosis, the various forms of food poisoning and roup, in chickens, were thoroughly discussed. A general discussion of swine diseases, led by President Mead, was enjoyed by all members present.

Dr. R. C. Moore, of St. Joseph, Missouri, addressed the meeting on equine practice. Dr. Moore emphasized the fact that the draft horse is again becoming an important factor in transportation and deplored the tendency on the part of the veterinarian to neglect this important part of practice more and more. Dr. Moore gave a very interesting description of the radical operation for fistula and poll-evil.

Federal Tuberculosis Eradication was presented by Dr. L. J. Allen, Inspector in Charge, for the Bureau of Animal Industry. Dr. Allen read the amended rules and regulations of both the B. A. I. and the U. S. Live Stock Sanitary Association. Dr. E. V. Robnett, State Veterinarian, gave a detailed review of the State's activities in tuberculosis eradication in the past year and outlined plans for conducting the work for the coming year.

Professor Smith, of the A. & M. College, presented an excel-

lent paper on practical poultry breeding and management. Resolutions were passed indorsing the pending legislation to appropriate funds for a veterinary college, to be established in connection with the A. & M. College, at Stillwater. A luncheon at the Huckins Hotel and the presentation of the Bureau's educational film, "Out of the Shadows," at one of the local theatres, were enjoyed by all members present.

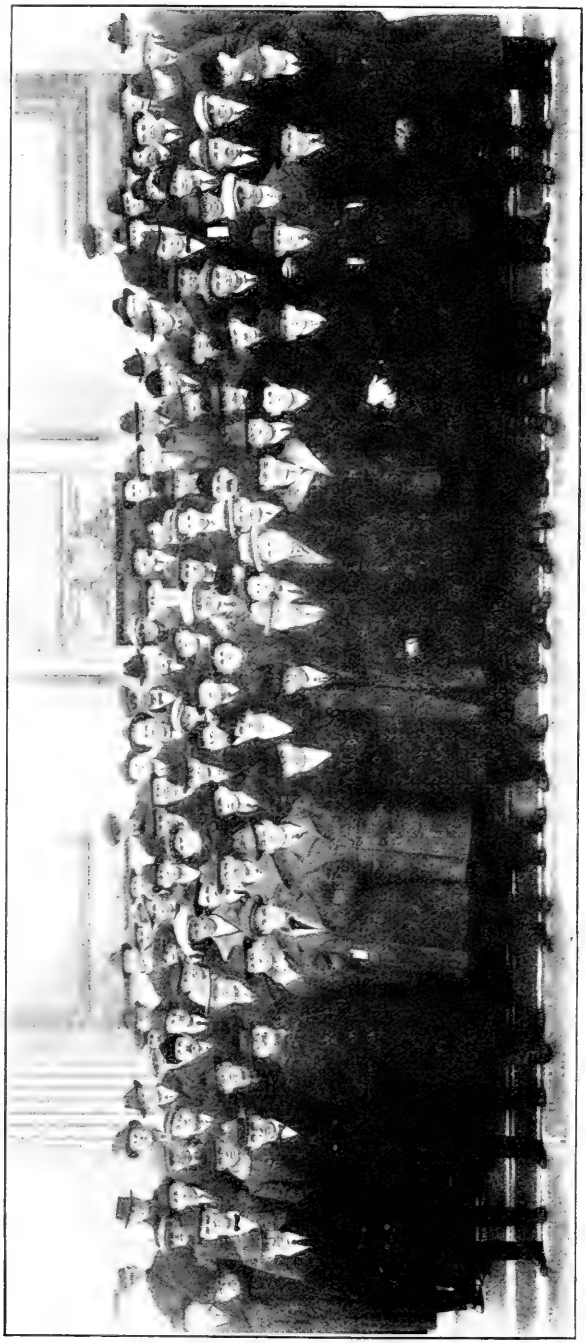
C. H. Fauks, *Acting Secretary.*

WISCONSIN SHORT COURSE FOR VETERINARIANS

The first Short Course for Veterinarians of Wisconsin was held at the State University, on January 24, 25 and 26. It was given cooperatively by the Wisconsin Veterinary Medical Association and the Department of Veterinary Science of the College of Agriculture. If the interest shown by those who attended is an index, it certainly was a decided success.

Laboratory and demonstrational work was largely substituted for the usual type of program consisting of formal papers and lectures. This innovation made it possible for those in attendance to perform certain experiments themselves, and to learn first-hand about some of the newly discovered facts relative to the causes and control of animal diseases. For example, each man took lung tissue from an animal, experimentally infected with *ascaris* larvae, and placed it between two glass plates; then he examined it with the aid of a microscope and found the living, writhing, lung stage of this destructive animal parasite.

Those who helped to conduct this Short Course were Doctors C. H. Covault, Veterinary Division, Iowa State College, Ames, Iowa, who told the Wisconsin veterinarians how the men in Iowa were meeting the present situation; H. B. Raffensperger, Zoological Division, Bureau of Animal Industry, who presented the subject of "Ascariasis in Swine;" J. G. Hardenbergh, The Mayo Clinic, Rochester, Minn., who demonstrated a new method of anesthetizing small animals; W. J. Embree, Live Stock Inspection Department of the Western Weighing and Inspection Bureau, Chicago, Illinois, who gave an illustrated lecture on "The Prevention of Live Stock Loss in Transit;" and J. A. Kiernan, Tuberculosis Eradication Division, Bureau of Animal Industry, Washington, D. C., who addressed the meeting on "Testing for Re-accreditation and Interstate Shipment."



Some of the attendants at the First Short Course for Veterinarians of Wisconsin, held at the University of Wisconsin, Madison, January 24-25-26, 1923.

In cooperation with Drs. Hadley and Beach, the following members of the Agricultural College faculty also assisted, by presenting interesting and instructive subjects: A. S. Alexander, "Live Stock Breeding in Scotland" (Illustrated); B. L. Warwick, "The Fur Farming Possibilities in Wisconsin;" R. S. Hulce, "Scoring and Judging Dairy Cattle;" F. B. Morrison, "Feeding Minerals to Live Stock;" W. H. Wright, "Laboratory Diagnosis" (Practicum); L. J. Cole, "The Recognition and Cause of the Free-martin;" and E. S. Savage, "Rations for Dairy Cattle." Many of the best known veterinarians of the state led the discussions.

Dr. Herbert Lothe, of Waukesha, presented a well-prepared paper entitled, "Interesting Cases Met in Practice." which brought out some splendid discussions on bovine practice. Dr. Alexander also held a conference with the veterinarians present to discuss the question of "Soundness of Stallions."

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association, was present on the afternoon of the 24th, and addressed the Short Course on "What the A. V. M. A. Can Do for the Practitioner." He outlined the program of work that had been laid out for him by the officers and executive board, asked for support of the Journal, and incidentally suggested that the Wisconsin veterinarians should not stop with just one invitation for the Association to meet in Madison. He brought out the point that it had rarely happened that any city had landed a convention without asking for it more than once, Montreal being the only exception, for some mysterious reason.

The newly elected officers of the Wisconsin Veterinary Medical Association are G. H. Harland, Pewaukee, President; C. A. Deadman, Madison, Vice-President; O. H. Eliason, Madison, Secretary; W. L. Richards, Morrisonville, Treasurer.

O. H. Eliason, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION

The fortieth annual meeting of the Ohio State Veterinary Medical Association was held at Columbus, Ohio, January 31st, February 1st and 2nd, 1923. All of the sessions of the meeting were largely attended, and in many respects the meeting was the best ever held. Harmony and optimism prevailed throughout.

The Wednesday afternoon session was devoted largely to routine business, and many excellent committee reports were presented. Worthy of special mention, were the reports of the Committee on Progress and Education, presented by Dr. S. T. Pyper, of Dayton, and the Committee on Diseases, presented by Dr. Earl W. Porter, of Reynoldsburg.

The entire day Thursday was devoted to the presentation and discussion of papers as follows:

"Obstruction of Small Intestines of the Horse," P. T. Engard, Marysville. Discussion by W. A. Axby and J. H. Blattenburg.

"Mastitis," E. C. Eddy, Cleveland. Discussion by A. J. Kline and R. H. Aull.

"Gastro-Enteritis in Small Animals," J. W. Jackman, Columbus. Discussion by L. W. Goss and Norton Dock.

"Digestive Disorders in the Hog. Dietetics," C. R. Niday, Gallipolis. Discussion by F. A. Zimmer and Leo Anderson.

"The Control and Treatment of Poultry Diseases that are Prevalent in Ohio," Alvin Broerman, Reynoldsburg. Discussion by O. V. Brumley and R. E. Rebrassier.

"Panters," C. B. Frederick, Canton. Discussion by F. E. Anderson and W. F. Wise.

"Remarks on the Stomach of the Ox (Illustrated)," Septimus Sisson, Columbus. Discussion by C. H. Case and R. A. Greenwood.

"Skin Diseases of the Dog," W. C. Woodruff, Cleveland. Discussion by Reuben Nilty and Howard Miller.

"Chloroform as an Anaesthetic for Swine," E. A. Downs, Mt. Sterling. Discussion by D. J. Frame and W. E. Jones.

"Avian Diphtheria (Roup)," H. P. Ropp, Ashland. Discussion open.

A banquet was held Thursday evening at the Hotel Deshler. The following speakers were called upon:

"Quo Vadis," Davis S. White, Columbus.

"Greetings from the A. V. M. A." W. H. Welch, President, Lexington, Ill.

"The Breeding of Animals," Carl W. Gay, Director Department of Animal Husbandry, O. S. U.

"Publicity," J. A. Maddox, General Agent Missouri Life Insurance Company, Columbus.

"Cooperation," Chas. V. Truax, Director of Agriculture.

"Daddy" Welch, President of the American Veterinary Medical Association, made quite a hit with our membership,

and in addition to giving an excellent address, he boosted the Montreal meeting strongly and effectively.

On Friday, an all-day clinic was held at the Veterinary Department, Ohio State University. The clinic was in charge of Dr. O. V. Brumley, and was divided into five sections as follows:

Section on Horse, in charge of Dr. W. A. Axby, Harrison.

Section on Cattle, in charge of Dr. C. H. Case, Akron.

Section on Small Animals, in charge of Dr. W. R. Hobbs, Columbus.

Section on Hog, in charge of Dr. C. W. Fogle, Leipsic.

Section on Poultry, in charge of Dr. L. W. Goss, Columbus.

The clinic proved very attractive to the membership and was very successful in every respect.

The following officers were elected for the ensuing year: Drs. Chas. W. Fogle, President, Leipsic; Bruce H. Edgington, Vice-President, Columbus; David C. Hyde, Treasurer, Columbus; Harry T. Moss, Secretary, Dayton.

We shall very probably not hold any more annual meetings at the same time as "Farmers Week" in Columbus, on account of the congestion.

F. A. Lambert, *Secretary.*

MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION

The usual brand of Michigan winter weather did not prevent the Wolverine veterinarians from attending the 41st annual meeting of the Michigan State Veterinary Medical Association, at Lansing, Michigan, February 6th and 7th. 1923. All of the sessions were held at the Michigan Agricultural College, at East Lansing. The morning session of the first day was devoted to the usual routine business. In his presidential address, Dr. J. E. Wurm, of Pigeon, called attention to some of the more important problems which the veterinary profession was being called upon to solve. Dr. Wurm not only showed a keen sense of diagnosis, but demonstrated his ability along the line of practical treatment, by outlining a number of corrective measures for the consideration of the Association.

The afternoon session was opened with an illustrated paper on the subject of "Vitamins and Deficiency Diseases," given by Dr. A. D. Emmett, of Detroit. The ladies attended this

lecture and showed their deep interest in the subject of nutrition, by the attention given the essayist.

Dr. J. F. Shigley, of St. Paul, Minn., addressed the Association on the subject of "Hormone Therapy." He stressed the fact that some of the glandular disorders of the human being are probably duplicated in animals, and that some of them might be amenable to treatment with extracts of certain glands in proper combination.

Dr. E. J. McLachlan, of the Department of Public Health, Jackson, Mich., presented a paper on "Municipal Milk Inspection." He called attention to the increased interest being taken by many municipalities in this work, and urged veterinarians to take a prominent part in urging the passage of milk inspection ordinances, wherever same do not exist.

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association, was on the program to talk on "Our National Association." He briefly reviewed what had been accomplished during the past few months in getting the new office organized and the various lines of work under way. He called attention to the fact that the officers of the Association, as well as the members of the Executive Board, were keenly aware of the dangers of the present situation as regards the present and future welfare of the veterinarian in private practice. At the same time, he called attention to the fact that the membership of the Association was made up of veterinarians engaged in a score or more lines of work; that the Association did not exist for any one particular group, and this fact must be kept in mind at all times.

Dr. Hoskins urged the support of the national Association by all state and local associations, as well as by all veterinarians individually. He asked for better support of the Journal, particularly from men in active practice, calling attention to the fact that one of the criticisms most frequently heard regarding the Journal, was that it did not publish sufficient matter of interest to the practitioner. Dr. Hoskins stated that this had not been the fault of former editors, but the fault lay with the practitioners themselves, as these men were the ones to furnish case and clinical reports, and with very few exceptions, they had failed to do so.

The annual Dinner Dance was held in the evening at the Masonic Temple, and after partaking of a splendid banquet, the

veterinarians and ladies spent the rest of the evening dancing and playing cards.

On Wednesday, the morning session was opened with an address by Dr. F. E. Stiles, of Battle Creek, on the subject of "The Treatment of Stomach Worms in Sheep." Dr. Stiles has given a great deal of attention to sheep diseases, and he had developed the technique for the administration of copper sulphate solution, to a point where he can treat 100 lambs per hour with little difficulty. Dr Stiles mentioned one particular lot of lambs that he had treated. These lambs had done so well that the owner showed them at the recent live stock show, in Detroit, where they took first prize, and were sold for 25c per pound. This fact had been given a great deal of publicity in the neighborhood, and as a result, Dr. Stiles reported a very marked increase in the demands made upon him for similar services.

Hon. H. W. Norton, Director of the State Bureau of Animal Industry, Lansing, outlined the proposed tuberculosis program for the State. Briefly, this involves reducing present indemnities by adopting the Federal plan, which provides an indemnity equal to one-third of the difference between the salvage and appraised value, but not to exceed $50.00 for a registered animal or $25.00 for a grade animal; an emergency appropriation of $200,000 for indemnities for the balance of the present fiscal year; the inauguration of a five-year campaign, starting July 1, 1923, to test all cattle in the State, as well as conducting all re-tests required in the Federal Accredited Area Plan; providing $400,000 annually for indemnities, and $120,000 annually for operating expenses of the Bureau of Animal Industry; enacting legislation to authorize county boards of supervisors to appropriate funds for the purpose of co-operating with the State and Federal governments in eradicating bovine tuberculosis, at the same time making compulsory the testing of all herds in such counties.

Dr. H. J. Stafseth presented the subject of "Differential Diagnosis of Poultry Diseases." This was followed by a question box conducted by Dr. H. M. Gohn. Some twenty applications for membership were favorably acted upon. An amendment to the Constitution was adopted, whereby the annual meeting of the Association will be held the latter part of June, instead of in February, as heretofore.

Dr. S. Brenton, of Detroit, was appointed to represent the

veterinarians on the Committee on Bovine Tuberculosis Eradication.

The four living charter members of the Association, Drs. S. Brenton, H. H. Clement, J. A. Dell and J. C. Whitney, were made life members of the Association.

Dr. Judson Black fittingly eulogized Dr. David Cumming, whose death recently occurred.

A motion prevailed for the present officers of the Association to hold over until the June meeting, in view of the amendment passed, changing the date of the annual meeting.

R. A. RUNNELLS, *Secretary-Treasurer*

SOUTH CAROLINA ASSOCIATION OF VETERINARIANS

The annual business session of the South Carolina Association of Veterinarians was held at the Jefferson Hotel, in Columbia, on January 22, 1923. The meeting was called to order at 4 p.m., and a large crowd assembled to discuss many subjects of interest to the veterinarians of the South. A banquet was held at 8 p.m. and this was followed by an election of officers for the coming year, which are as follows:—Dr. W. K. Magill, of Chester, President; Dr. T. J. Kinard, of Ninety-six, Vice-President; Dr. M. R. Blackstock, of Spartanburg, Secretary-Treasurer.

The next meeting will be held in Chester, July 1923.

M. R. BLACKSTOCK, *Secretary-Treasurer*

THE VALUE OF A GOOD NAME

For some months the New Orleans Item canvassed the State with a view of finding out just "who's who" in Louisiana, both living and dead. In the vote taken two Baton Rouge citizens were honored, Col. T. D. Boyd and Dr. W. H. Dalrymple. Governor Parker, who was generally selected as the most renowned living son of Louisiana, in his selection of the five greatest living men of the state, named Dr. Dalrymple as one of the five.

If the vote was taken only among Baton Rougeans, who have known Dr. Dalrymple all of his life, we have no hesitation in stating that Governor Parker's selection would be unanimously endorsed.

We do not know of any man who has worked more zealously for the good of others, than has Dr. Dalrymple. His life has not been one of getting but of giving.

—*Baton Rouge Sunday News.*

COMMUNICATIONS

A PERSIAN TABBY (?)

To the Editor:—

While reading a case report in the November, 1922, number of the London Veterinary Journal by an English veterinarian, the following expression was noted:"—pretty Silver Persian tabby".

It is difficult to understand how a Silver Persian cat can be designated a tabby. It appears that it would be just as safe to use the expression "a beautiful thoroughbred collie". It is presumed that the author intended the word "tabby" to designate the sex, but it has no relationship whatever to sex, referring rather to a combination of colors in the coat of fur.

Respectfully,

E. I. Smith.

Nashville, Tenn., January 17, 1923.

DR. GOODMAN IMPROVED

To the Secretary:—

With further reference to your inquiry under date of January 23, 1923 regarding the present condition of Dr. B. M. Goodman and his circumstances, please be advised that I visited Dr. Goodman at the residence of his parents, 3441 Hallwood Place, Cincinnati, Ohio, found him much improved in health and showing a gain of about fifteen pounds in weight since I last saw him. He ascribes this favorable change to a new treatment for diabetes consisting of injections of insulin. He seems to be very much encouraged with the improvement in his condition and believes that he will be able to do remunerative work in about a month.

In regard to his finances Dr. Goodman said that his relatives were very good to him but that he himself was without funds to pay for treatments which cost about $12.00 per week. He is very grateful for what our association has already done for him. I am sure that any further financial assistance that may be given Dr. Goodman will be in conformity with the purpose for which the relief fund has been created and will be gratefully appreciated by the recipient.

Yours very truly,

Frank Jelen.

Cincinnati, Ohio, February 9, 1923.

NECROLOGY

"Man that is born of woman is of few days and full of trouble. He cometh forth like a flower, and is cut down, he fleeth also as a shadow, and continueth not."

EDWARD HORSTMAN

Dr. Edward Horstman, a veterinary inspector in the Bureau of Animal Industry, died from carcinoma of the liver, on the afternoon of December 3, 1922, at the All Saints Hospital, Fort Worth, Texas. On December 5th he was buried in Mt. Olivet Cemetery, at Fort Worth, with Masonic honors.

He was born in Cincinnati, Ohio, June 7, 1868, and graduated from the Cincinnati Veterinary College in 1908. He immediately entered the service of the Bureau of Animal Industry, which he served faithfully without any interruption until the time of his death. Dr. Horstman was stationed several years at Natchez, Mississippi, supervising tick eradication work in that section; during the interim he met Miss Esther Foster and they were married February 13, 1913 at the First Presbyterian Church in Memphis, Tenn. Later on he was stationed at other important points in Mississippi and subsequently in Louisiana, Georgia and Texas.

Dr. Horstman was a member of the American Veterinary Medical Association and the Masonic Fraternity. He was a student and well-posted on matters pertaining to veterinary medicine. He was a good speaker, a splendid writer and kept himself well-informed on current issues of the day. All through his service with the Government he was sincere and ambitious to perform his duties fearlessly and in a manner which displayed a conscientious spirit. He was an indefatigable worker and gave close attention to details. He was always trustworthy, never shirking a duty, and when his intrepid soul took its flight to God the Bureau lost a loyal and tireless employe. He was a man of pleasing personality, cordial and kindly to those who came in contact with him. His many friends who had occasion to visit his home were always received with a warm welcome and entertained with a degree of hospitality which will be long and pleasurably remembered.

Dr. Horstman had a thorough knowledge of southern conditions and understood all the phases of field work. He liked the

South and frequently expressed a desire to remain always in Dixie. And now, amid the familiar scenes of his activities, our lamented friend sleeps—silent, still, and unmolested, in the land of perpetual sunshine, with the stars of Heaven as his nightly vigils, there to await the dawn of the resurrection morn. He has been summoned from his labors in this vale of tears, to commence a new service where peace reigns supreme on the other side of the Great Divide. May his dreamless dust rest peacefully beneath the green, to await the final call to join the Caravan Eternal.

E. I. S.

CHARLES H. HOWARD

Dr. Charles H. Howard was born on Amherst Island, near Kingston, Ontario, Canada, June 9, 1868. His early life was spent on a farm, but later desiring to study veterinary medicine, he attended and graduated from the McKillip Veterinary College in the year 1899. After securing his diploma, Dr. Howard practiced for a while at Gladwin, Michigan, later going to Coldwater, at which place, on Sept. 21, 1904, he was united in marriage to Miss Emma Stevens, who died May 17, 1921. To this union was born a daughter, Ethel Elizabeth, now 16 years of age.

In the fall of 1906, the family moved to Houghton, Mich., where Dr. Howard resided at the time of his death, June 9, 1922. Dr. Howard died on his birthday, being 54 years of age the day of his death. Both Dr. and Mrs. Howard, being of a kindly nature and generous disposition, prospered not only in worldly goods, but in a host of true and lasting friendships, made in both Coldwater and in the Copper Country. The members of the family were affiliated with the Methodist Episcopal church, of which Mrs. Howard had been a member since girlhood.

The immediate cause of Dr. Howard's death was cerebral hemorrhage. Dr. Howard joined the American Veterinary Medical Association in 1900, the year following his graduation from the McKillip Veterinary College, having been in good standing during the entire period.

"Thus do we pass from the earth and its longings,
Only remembered by what we have done."

JOHN OLIVER

The subject of this tribute, Dr. John Oliver, was born in Noxube County, Mississippi, February 27th, 1860. He died at his home in Columbus, Miss., on the night of July 1st, 1922.

He graduated from the Ontario Veterinary College in 1896. He practiced for more than 26 years. He was one of seven to organize the Mississippi State Veterinary Medical Association in 1906. He was one of the first five to serve on the State Board of Veterinary Examiners in Mississippi. He was for more than sixteen years a useful and honored member of the Mississippi State Veterinary Medical Association. He belonged to that character in the generation, the last of whom are now passing from public action.

He was a model husband and father. His devotion to his wife and children was really beautiful and his life from day to day lived out before his family was along the highest plane and was most beautiful in its fruitage to all who had the happiness to share his confidence. He was a quiet man, modest to the last degree, unpretentious and most winning in his manner. His striking figure will seem to be hovering about the meetings of the Mississippi State Veterinary Medical Association for a long time. It is the friendship of such a character as dear old Doctor John Oliver that makes life worth living. His noble qualities have been a stimulant to us. We loved him in life and we respect his memory now that he is dead.

Therefore, be it resolved that we tender our profound sympathy to the relations and friends of the deceased and assure them that we mourn with them in their sorrow for the loss of one who so richly merited their confidence and affection and, be it resolved, further, that these resolutions be spread upon the minutes of this Association as a mark of esteem in which this body held the deceased and as a token of reverence for his memory. Be it also resolved, that a copy of this resolution, suitably engrossed, be furnished by the secretary to the relations of Dr. John Oliver and a copy be sent to the Journal of Veterinary Medicine and the American Veterinary Medical Association for publication.

Committee { E. S. Norton
W. P. Ferguson
C. D. Crawford }

DAVID CUMMING

Dr. David Cumming, of Port Huron, Michigan, a charter member of the Michigan State Veterinary Medical Association, and one of the oldest practitioners in the State, died January 31st, 1923. Pneumonia was the cause of his death, Dr. Cumming having been sick only two days.

Dr. Cumming was born June 26, 1842. He graduated from the Ontario Veterinary College in 1870. After practicing for a

DAVID CUMMING

few years in Canada, he removed to the United States and located in Port Huron, in 1879. At the time of his death Dr. Cumming was one of the few remaining charter members of the Michigan State Veterinary Medical Association, and several years ago was placed on the honorary membership roll.

On April 24, 1920, the veterinarians of Michigan gathered in Detroit to do honor to Dr. Cumming, by marking in a fitting way the 50th anniversary of his graduation from the Ontario Veterinary College. The occasion was a unique and memorable event. One year later, the same group of veterinarians gathered to honor in a similar way, Dr. Joseph Hawkins, who graduated

from the Ontario Veterinary College in 1871. Dr. Cumming was present on this occasion, and it proved to be the last veterinary gathering graced by his presence. Dr. Cumming leaves his widow, one son and one daughter to mourn his loss. His memory was fittingly eulogized at the recent meeting of the Michigan State Veterinary Medical Association, which took place one week following his death.

LOWERY LAMONT LEWIS

Dr. Lowery Lamont Lewis, one of our great friends and coworker, was removed from our ranks by death, on Sept. 26th, 1922, at his home at Stillwater.

Dr. Lewis had been connected with the Agricultural and Mechanical College for the past 26 years. All classes of the College, offices and business houses in Stillwater were closed during the funeral as a tribute of respect to the instructor and educational leader.

Dr. Lewis was born at Newport, Tenn., Sept. 3rd, 1869, being 53 years of age at the time of his death. At the age of ten years the family moved to Texas, where he received his education at the Texas A. and M. College, also taking post-graduate work there, being graduated with the degree of B. S. A., in 1893. In 1894 he received the degree of M. S. Later, he took post-graduate work at the Iowa State College, receiving the degree of D. V. M.

He came to the Oklahoma A. and M. College in 1896 as Professor of Veterinary Medicine. His duties and influence grew in scope during the years that followed, and at the time of his death he was Professor of Veterinary Medicine, Professor of Zoology, Experiment Station Bacteriologist and Veterinarian, Dean of the School of Veterinary Medicine, Dean of the School of Science and Literature and Dean of the faculty, and had the longest career as a member of the faculty of any person in the history of the College.

Dr. Lewis was married at Topeka, Kansas, Sept. 30th, 1903, to Miss Georgia Holt. They had two children, who with his sister and widow are the immediate surviving relatives.

The daily papers, the Texas Aggie, of the Texas A. and M. College, and the veterinary journals, all published a lengthy eulogy for this great man, with a fine personality, resolute in decision, natural leader, practical scientist, protector of animal

industry in Oklahoma, a loyal and good citizen of his adopted State, friend of all and a great worker in our State Association.

By his coming the A. and M. College received a marked impetus in scientific research and wide service, the fruition of which he lived to enjoy. Gentle in manner and unassuming, yet he impressed all who had the privilege of his acquaintance that he was a man, big in mind, in heart and in soul. He leaves a record of achievement which is an enduring monument to his memory, and a remembrance of his example will ever be an inspiration to the members of this association.

"His influence cannot die. It will grow and spread forever."

Committee on Necrology, Oklahoma State Veterinary Medical Association
C. H. Anthony
T. W. Brewer
C. R. Walter

JORGE MARTINEZ S.

Dr. Jorge Martinez S., a Colombian physician, died on September 11th, 1922, at Bogotá, Colombia, South America, as a result of an accidental infection with the bacillus of diphtheria.

Dr. Martinez S. received his training at the Medical School in Bogotá, later in Paris and London, and finally at the Harvard Medical School of Tropical Medicine. After completing these studies he visited several laboratories in the United States, particularly those of the New York City Department of Health and the Bureau of Animal Industry, at Washington, D. C.

He was about 38 years of age when he died, and was perhaps the leading investigator of tropical diseases in Colombia. He was deeply interested in the live stock industry of his country, so much so that he referred questions relating to diseases of animals to well-trained veterinarians. His recognition of the value of scientific veterinary medicine led him to be one of the most important factors in causing the Colombian legislators to establish the Escuela Nacional de Veterinaria de la Universidad de Colombia, in 1921.

Those who knew or came in contact with Dr. Martinez will always remember him as a serious student of his work, and a man with a kind heart and a pleasing personality.

C.V.N.

ANDREW M. McCOLLUM

It is with a heart clouded with sadness, which I am sure is participated in by the pioneer veterinarians of California, the California State Veterinary Medical Association and the profession in general, that I have to chronicle the demise of an enthusiastic and ardent member of the profession, Dr. Andrew M. McCollum, of Sacramento, on the 15th day of December, 1922.

Dr. McCollum had been in poor health for a long time and

DR. A. M. MCCOLLUM

fought bravely to stay with those he loved, but he suddenly took a change for the worse and just as bravely yielded to the inevitable.

Born in Toronto, Canada, in the year 1851, where he was carefully reared and educated, he in 1873 entered the Ontario Veterinary College, from which institution he graduated May 19th, 1875. After practicing in that city for some five years he came to California and established a practice in Sacramento, which he maintained until some six years ago, when on account of ill health he was compelled to retire. During twenty-six years of

this time he was veterinarian to the famous Rancho del Paso where he was called upon to treat some of the most world-renowned Thoroughbreds, among them being Salvator, Tenny, Ormonde and the queen of the turf, Farenza.

He was a charter member and first secretary of the California State Veterinary Medical Association and later its president. Was elected to life membership some years ago in token of the esteem of his fellow members for his untiring devotion toward veterinary legislative activity.

In the death of Dr. McCollum the community has lost a valuable citizen, the profession a sterling member and the family a loving husband and father. He leaves a wife and two children and a host of friends to mourn his loss.

D. F. F.

JAMES B. ASHCRAFT, JR.

In the February number of the Journal was published a resolution on the death of Dr. James B. Ashcraft, Jr. Since the publication of this notice, a few meager details concerning the death of Dr. Ashcraft have been received in this country. A letter from Dean David S. White contains the following information: "Last November, his brother, Derwin W., a student in this college, received a cablegram stating that Dr. Ashcraft had died. Later his body arrived in Columbus marked "Suicide". A letter from one of Dr. Ashcraft's colleagues, an American, stated that his body was found in the bathroom of the house in which he lived. He had been stabbed to death. Later a report was received from the representatives of our Government concerning his death. As there were a good many discrepancies in this repert and as none of us know any reason why a man of his education, optimistic temperament and good mentality, should take his own life, a re-investigation of the whole affair has been undertaken."

Dr. Ashcraft graduated from the Ohio State University in 1920, and was soon thereafter appointed Professor of Veterinary Medicine in the University of the Philippines, and was stationed at the Los Banos Agricultural Station, about eight miles out of Manila. It is reported that Dr. Ashcraft delivered his regular lecture at 9 o'clock on the morning of his death and was found dead at about 11:30 a.m. He had apparently been in good spirits and the theory that he had taken his own life while

mourning the recent death of his father is discounted by members of the family. His father, James B. Ashcraft, a Columbus contractor, died on October 16th. Dr. Ashcraft came of a fine New England family, and Dean White states that he was one of the best students he ever had, and that in character he was "as clean as a hound's tooth". He was a graduate of the Connecticut Agricultural College prior to taking up veterinary medicine. The War Department has been requested, on behalf of the family, to make a thorough investigation of the facts concerning the death of Dr. Ashcraft.

LEE H. P. MAYNARD

Dr. Lee H. P. Maynard, of Philadelphia, Pa., was accidentally shot and killed by a fellow hunter and companion, Dr. Charles A. Hoak, of Harrisburg, Pa., on October 9, 1922. Both were members of a hunting party from Pennsylvania, the accident occuring near Squaw Pan Lake, Maine. Dr. Hoak, who had seen one deer, mistook Dr. Maynard for another and fired. The bullet struck Dr. Maynard in the neck and caused instant death.

Dr. Maynard graduated from the Veterinary Department of Ohio State University, in 1904. He was a very good student and took an active part in athletics, having been a member of his Varsity football squad. After graduation he located in Philadelphia, where he established the Dairy Laboratory. This laboratory, besides doing a great deal of work for physisians, veterinarians and dentists, rendered laboratory service to a number of the larger dairies in and around Philadelphia. Dr. Maynard joined the American Veterinary Medical Association in 1908. He leaves a wife and one child.

GEORGE L. RICHARDS

Lt. George L. Richards died about nine months ago, in Denver, Colo., of tuberculosis and tumor of the brain. At the time of his death, Lt. Richards was in the Army service and had spent a part of the year at the Colorado Agricultural College, Division of Veterinary Medicine, taking post-graduate work. Lt. Richards was an alumnus of the institution, having received his veterinary degree in 1913. He joined the American Veterinary Medical Association in 1917, and was also a member of the

Colorado State Veterinary Medical Association. Following graduation, Lt. Richards located at Ordway, Colo., and when the United States entered the war, he joined the Veterinary Reserve Corps, and was attached to the 78th Field Artillery, first at Camp Doniphan, Okla., later going to France with the American Expeditionary Forces. After his return to this country, Lt. Richards was located at Fort Des Moines, Ia., and later Fort Collins, Colo.

Lt. Richards was born May 27, 1892, at Omaha, Neb., and was a graduate of the Littleton (Colorado) High School. He was a member of Alpha Psi Fraternity.

GEORGE HOME CARTER

Dr. George H. Carter, for more than 30 years a practitioner of Saginaw, Michigan, died December 25th, 1921, after an illness of 10 days, due to heart failure and pneumonia. Dr. Carter was born in Guelph, Ontario, April 24, 1856, and received his early schooling there. He graduated from the Ontario Veterinary College in 1888, and located in Saginaw two years later. He was married August 24, 1898 to Miss Jennie B. Hubbard, who survives him, together with a sister, Mrs. Wm. Harrison, Guelph, Ont.

Dr. Carter served under several mayors as Market and Food Inspector of Saginaw. He joined the American Veterinary Medical Association in 1911. He was a member of the Michigan State Veterinary Medical Association, a member of the Presbyterian church, of Saginaw Lodge No. 77 F. & A. M. and Saginaw Chapter No. 31 R. A. M.

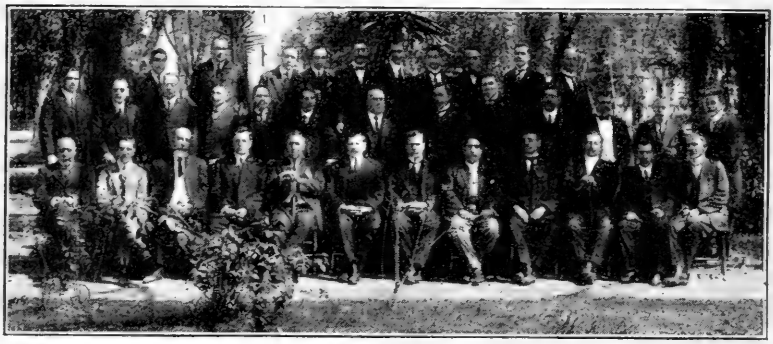
(The notice of the death of Dr. Carter is published at this late date, as his death was brought to the attention of the Secretary, by the widow, only recently. The statement which appeared in a contemporary Journal recently, that Dr. Carter died several months ago, is incorrect.—*Editor.*)

DR. DAVIS RESIGNS

Dr. Benj. F. Davis has resigned the office of State Veterinarian of Wyoming, to accept the position of Secretary-Manager of the Frontier Days Show. Started 27 years ago on a "fly-by-night" scale it has grown to be the biggest spectacle of its kind in the world. It has become such a large institution that it now requires the full and undivided attention of one man all of the time. We congratulate the Show upon getting such a capable Secretary-Manager as Dr. Davis.

MISCELLANEOUS

A General Veterinary Hospital for the U. S. Army Reserve Corps is being organized at the University of Pennsylvania School of Veterinary Medicine.



Staff of the National Veterinary School of Mexico
Photograph sent to Dr. N. S. Mayo by Dr. Carlos E. Pavia

Michigan veterinarians have been enjoying a real old fashioned winter. A letter just received from Dr. J. E. Wurm, of Pigeon, states that for the first time in three years he has been compelled to drive horses in getting to his patients. Dr. Wurm says that it is somewhat of a treat, but very slow navigation.

A recent newspaper report, which was given rather wide publicity, contained the statement that ministers were the only ones who did not make any money during 1922. Even veterinarians were not excepted.

Discernment

The Italian Senate's unanimous vote of confidence in Mussolini is somehow reminiscent of an old story:

"Why do you think your dog loves you?" asked the nice old lady.

"Because he knows I'd knock the stuffin' out of him if he didn't," the boy replied.

Philadelphia Inquirer

PERSONAL

Dr. A. A. Husman has been transferred from Birmingham, Ala., to Jacksonville, Fla.

Dr. E. C. W. Schubel, formerly of Danville, Ill., is now located at Jackson, Michigan.

Dr. Arthur E. Slocum has removed from Denver, Colo., and is now located at Sioux Falls, S. D.

Lieut. Chas. M. Cowherd has been transferred from New Orleans to Fort Sam Houston, Tex.

Dr. W. L. Williamson has removed from Fort Russell, Wyo., and is now located at Rocky Ford, Colo.

Dr. Frank T. Kocher, formerly of Sunbury, Pa., has removed to Espy, Pa., where he is engaged in practice.

Dr. Edward A. Rile, of Ambler, Pa., has just returned from a hunting trip in Virginia, where he shot four bears.

Dr. Wm. B. Price, of Carstairs, Alberta, has been elected Secretary of the Veterinary Association of Alberta.

Dr. E. P. McBane is now located at Frankfort, Ind., having disposed of his practice in Valdosta, Ga., several months ago.

Dr. B. J. Finkelstein, formerly of Cherry Valley, N. Y., has removed to Brooklyn, where he is now located at 422 Sheffield Avenue.

Dr. Victor Ballou has been appointed an agent of the Pennsylvania State Bureau of Animal Industry, and is stationed at Sunbury, Pa.

Dr. Paul V. Clarkson has accepted a position with the Pennsylvania Bureau of Animal Industry, and is now located at Lancaster, Pa.

Dr. Chas. F. Wolf has accepted a position with Parke, Davis & Co., and is now attached to the Animal Industry Department at the home offices in Detroit.

Dr. Robt. J. Robertson has removed from Ithaca, N. Y., going to Richmond, Calif., where he has resumed private practice. He gives his address as 537-5th St.

The friends of Dr. Howard B. Felton, of Philadelphia, Pa., who suffered a stroke of paralysis shortly after Christmas, will be pleased to learn that Dr. Felton is improving.

Dr. C. A. Schaufler, Inspector-in-Charge of the Philadelphia U.S. Bureau of Animal Industry Office, the oldest officer in the length of service, is eligible to retirement on June 23, 1923.

Dr. Frank L. Kampschmidt, of Los Angeles, Calif., has tendered his resignation as a member of the A.V.M.A. Dr. Kampschmidt is now practicing as a Chiropractor and Naturopath.

Dr. A. L. Tiffany, of Monroe, Mich., was injured in an automobile accident, which occurred on February 6th. Another machine ran into Dr. Tiffany and caused the latter's car to go into a ditch.

Dr. B. M. Underhill addressed the Cumberland Valey Veterinary Club, at Shippensburg, Pa., on the subject of "The Life History, Diagnosis and Treatment of Internal Parasites," on January 4, 1923.

Dr. Fred Boerner addressed the Delaware-Lehigh Valley Veterinary Club, on the subject of poultry diseases, at the December meeting of the club. Dr. Boerner illustrated his remarks with lantern slides.

Dr. R. C. Riegel, of Harrisburg, Ill., is now in Clovis, New Mexico. He has been there since October last, in the hope of regaining his health, which has been seriously impaired ever since he was in the Army.

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Dr. Robert H. Wilson, of Rochester, Mich., was the first out-of-town member to call at the Association office. He dropped in for a brief chat with the Secretary, on February 10th, while in Detroit on a business mission.

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Dr. T. E. Munce, member of the Executive Board for District No. 2, and State Veterinarian of Pennsylvania, recently filled the role of Acting-Secretary of Agriculture of Pennsylvania, in the absence of Secretary Willitts.

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Dr. Ralph W. E. Daniels, on account of illness, has been obliged to resign his position as Resident Veterinarian in the Speyer Hospital for Animals in New York City, and has returned to his home in Philadelphia.

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Dr. Evan L. Stubbs, of Oxford, Pa., is conducting some very interesting research work on the "Intradermal Test for Avian Tuberculosis" in the Laboratories of the Pennsylvania Bureau of Animal Industry at Philadelphia, Pa.

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Dr. C. J. Marshall addressed the Northwestern Pennsylvania Veterinary Club, at Sharon, Pa., on January 8, 1923. His topic was "The Work of the Ambulatory Clinic for the Past Year at the University of Pennsylvania School of Veterinary Medicine".

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H. W. Jakeman, formerly Associate Director of the Biological Laboratories of Pitman Moore Co., Zionsville, Indiana, has been transferred to sales work and has been placed in charge of the New England territory at the Boston office of the Company, 44 Bromfield St., Boston, Mass.

NOTICE

Nominating ballots for the election of Executive Board members for Districts Nos. 2 and 3 were mailed from the Secretary's office, on February 27, 1923, which was "six months prior to the annual meeting," as specified in the constitution and by-laws.

The terms of the present incumbents of these two offices will expire at the close of the coming annual meeting in Montreal, at which time the two members-elect will assume their duties.

Ballots have been mailed to all members in good standing in Districts Nos. 2 and 3, calling for nominations. These should be returned promptly to the office of the Secretary, 735 Book Building, Detroit, Mich.

Later, election ballots will be mailed to all members in good standing, in these two Districts. Electing ballots will contain the names of the five members, in each District, who received the highest number of nominating votes.

District No. 2 consists of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania and Delaware.

District No. 3 consists of Michigan, Wisconsin, Illinois, Indiana and Ohio.

Polls close April 27, 1923.

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