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The War Ends

An Army colonel is reported to have said "We had all our plans made and all arrangements completed for a war effort that would have far eclipsed anything that has been seen heretofore and then here comes peace and spoils them all." Whether the report is true or not, and it probably isn't true, the sudden surrender of Japs imposes a problem of re-conversion that demands an effort not less than that of war.

At writing no announcement has been made concerning discharge of veterinarians from the military service. The majority of veterinarians like the vast majority of all others in the armed forces are anxious to get about the task for re-establishing themselves in civilian life. Veterinary practice is excellent at present and it is a propitious time to resume old practices or establish new ones. Salaried positions await applicants. Many feel that by remaining in the military service, even for a few months longer, opportunities, more desirable than will be available later, will be missed. Naturally morale has suffered. Most of those who desire an immediate discharge can see no further need for their services in the military establishment, particularly is this true of those returned from overseas service, where to quote some of them "veterinary officers were two deep," and of those currently in Army schools who see no further need for the training.

However, there is still a need for veterinary service in the Army and there long will be a need for a far greater service than the regular Veterinary Corps, as now constituted, can supply. Further, the advantages of early discharge, like distant pastures, are less desirable than they seem. There are some advantages to security during the confusion of civilian re-conversion. Complaint is justified only if release from the military service is delayed a day beyond the date when it is determined one's services are no longer required, or if there be more than minor inequities in the order of discharges.

The adoption of a philosophic attitude toward one's discharge would appear to be the part of wisdom. Efforts of the individual, or of others for him, are not likely to have much influence upon the date of his discharge, except where a claim of injustice can be maintained. If a preference is to be shown to any, it should be to those who, through no fault of their own, are serving in the enlisted grades. The civilian population, henceforth, can undoubtedly utilize their services to better advantage than can the Army.

Even when separation from the armed forces is effected, immediate launching into practice or food inspection or teaching or research or commercial lines or other veterinary activity may not be the wisest course for most veterans. The educational privileges afforded by the "G.I." bill should be considered carefully. A year of graduate work, and a longer period for those who were under 25 years of age when they entered the military service, is almost certain to pay valuable dividends in achievement throughout the remainder of any veterinarian's career. Even a quickie (refresher course) may justify delay of the serious business of locating.
The milk production of the Colorado State College dairy herd was increased 2% by removing the chill from the drinking water with a tank heater.

**Dairy Herd Improvement**

At the beginning of 1944 there were 293 cooperative bull associations in this country with a membership of 6,213 dairymen owning a total of 62,473 cows. Of the proved sires used by these associations, 89 had records indicating an average production for their daughters of 408 pounds of butterfat per cow per year. Jan. 1, 1944, there were 96 artificial insemination associations with a membership of 28,627 dairymen owning 218,070 cows. These associations were using 657 bulls, approximately one bull for each 331 cows. Of the 657 bulls 127 had proved-sire records indicating an average production for their daughters of 420 pounds of butterfat per cow per year.—Ann. Rept., U. S. Bureau of Dairy Industry for 1944.

**Frozen Whole Milk for Patients**

A result of a series of researches carried out by the Veterinary Division of the Office of Surgeon General, is a new method of quick-freezing milk which, even after being frozen three months, is as appetizing as fresh milk and has a lower bacterial count than the average milk supply. Large amounts of frozen whole milk are being shipped from many ports on both the east and the west coast. Except for the American troops in Alaska being supplied 400,000 pints per month, the production is going exclusively for use on hospital ships. As greater quantities are produced overseas hospitals will be supplied with the frozen whole milk.

Research in the Bureau of Dairy Industry, U. S. Department of Agriculture affords conclusive proof that the practice of feeding U. S. No. 3 timothy hay to milk cows, which is common in many parts of the country, is unsound, mainly because it is a poor source of vitamin A. If hay is not good enough for horses the quality is too poor for dairy cows.

In dairy herd improvement associations one cow in five is discarded every year.

For each pig dead at birth, 140 pounds of feed is wasted. Death at 10 weeks wastes 260 pounds of feed. At 18 weeks, 360 pounds are lost; at 26 weeks, 602 pounds. This represents only the loss of feed, and doesn’t take into account the time and care expended, or the actual loss of pork or pork products.

To whom can you turn for the diagnosis, treatment, and prevention of your mastitis problems? The answer is simple and obvious—the trained veterinarian. No one else can or should try to help you. His training and practical experience is found in no other individual and if you feel you can afford to combat mastitis you had best have the advice of a winning second in your corner. Horace Parker in Hoard’s Dairyman, 3-25-45.

Over a period of more than 20 years, in the herds at the Beltsville experiment station, the average age of proved sires at the time of their last successful service was: Holstein bulls, 12 years; Jersey sires, 10 1/2 years.

Of the 10 Holstein sires only three became sterile and were slaughtered. Three died from foreign bodies; two as a result of accidents and two from other causes.

Of the 10 Jersey bulls six became sterile; one died from accidental injuries and three from natural causes.

**Brucellosis Control in Michigan**

The percentage of reactors and suspects in Michigan cattle, as shown by blood samples submitted by veterinary practitioners has increased steadily since 1938. In that year it was 6.8%; in 1939, 7.2%; in 1940, 8.5%; in 1941, 8.4%; in 1942, 10.5% and in 1943 it was 11.7%, an increase of more than 72% in five years.

Commenting on the brucellosis control project in Michigan, Dr. B. J. Killam, in charge of the project for the state says:

“The outlook for satisfactory brucellosis control at an early date is not good.” And again, “The drastic test and slaughter plan is not in accord with production needs and will have to be curtailed.”

**Goat**

Goat farming means the keeping of goats, the raising of a breed of farm animals which are held as the fourth great element in the farm industry of the world. But the goat is not used in the United States so much as in the United Kingdom and in European countries where goats are raised as a pet and for the production of milk and meat.
Regulations for Livestock Shipment Need Revision

Generally speaking uniform regulations for the interstate shipment of livestock are desirable and it is hoped that they may be put into effect in the not distant future. Doctor Butler in his discussion in the August issue of VETERINARY MEDICINE (p. 274) points out a basic obstacle to this consummation when he says:

"The primary and fundamental reason (for lack of uniformity in such regulations) is due to our lack of knowledge of livestock disease conditions in the various states and the lack of uniformity and adequacy of the veterinary service for the control of dangerous diseases of livestock which is provided in the several states."

To make effective the operation of uniformity, in general principles for prevention of spread of disease through importation of animals, it will be necessary that the status of communicable diseases be practically the same in all states, i.e., safely under control. At least the incidence of such diseases should be known in each state as a result of communicable disease surveys and current reports.

The work of the several committees on the development of systems of disease reporting is to be commended and encouraged. A reasonably thorough system of this kind, together with the data which should be accumulated from post-mortem records, would facilitate drafting of the much desired rules and regulations.

Disease control problems are national problems just as certainly as they are local ones. I do not have the feeling that we are curtailing states' rights or local privileges when enforcement of disease control regulations is delegated primarily to representatives of the federal Bureau of Animal Industry. When the Bureau is sufficiently strong that it can have proper representation at strategic points throughout several states and territories, then the enactment and enforcement of rules and regulations bearing upon interstate shipments should follow. When that time comes the United States Livestock Sanitary Association, through a proper committee, will be in a splendid position to advise the Bureau from time to time on suitable revisions in the interests of the livestock industry.

The Livestock Department of the County of Los Angeles has often been on the defensive for requiring a tuberculin test of imported cattle that are not accompanied by a certificate of a test within 60 days by an accredited or official veterinarian. But I think the record of the retests made at destination amply justifies this measure, as is illustrated by the paper which I presented during the last convention of the United States Livestock Sanitary Association. The percentage of tuberculosis which we find present as indicated by our tests administered on arrival is higher than the minimum allowed for accreditation by the federal government and the several states.

Clean shipments are numerous, of course, but scarcely a week goes by in which we do not have one or more carloads in which there are from one animal to 10% tuberculin reactors. We find the exposure in some cases so definite that we quarantine the shipment for time sufficient to allow development of reactions among other animals in the same shipment, especially if they came from the same herd at point of origin. If we were to allow the sale of such car lots without removing reactors, we would be subjecting relatively clean herds in this milk shed to unnecessary exposure. This protection is not afforded in the present laws, rules, and regulations applicable to interstate and local shipments. The number of new cows received last fiscal year passed the 50,000 mark, and it looks like it might repeat that figure again this year.

Whether one regards this tuberculin testing on arrival as a departure from uniform regulations or as an illustration of the need for revision of present regulations may depend upon whether one is on the sending or receiving end in interstate shipments. In any case the argument for revision is a strong one.

The major scourges that have swept across the country are practically all under control. Consequently the great variety of state laws, rules, and regulations pertaining thereto are out-moded. We are facing an inevitable period of reconstruction in the Department of Agriculture and the Bureau of Animal Industry, to which I believe we can look forward with confidence. In consequence the livestock industry should be served in the future by a stronger Bureau, more generally represented throughout the several states.

Los Angeles, Calif.

L. M. HURT
Appointments for Scientific Officers
U. S. Public Health Service

A competitive examination for appointment in the Regular Corps in grades of Assistant grade (1st Lieutenant) and Senior Assistant grade (Captain) will be held on the dates listed below.

Regular Corps appointments are permanent in nature and provide unique opportunities to qualified scientists for a lifetime career in one or more of a large number of fields allied to public health, including research. Assignments are made with all possible consideration of the officer's demonstrated abilities and experience.

Examinations will be oral and written. The written examination will be held on October 8, 9 and 10 at places convenient to the candidate and the Service.

An applicant for the Assistant grade must be a citizen of the United States, must present a diploma of graduation from an institution of recognized standing, must have had at least seven years of education (exclusive of high school) and professional training or experience, and must have a physical examination at place of oral examination by a medical officer of the Public Health Service.

An applicant for the Senior Assistant grade must meet the requirements for the Assistant grade and must have had an additional four years of training or experience.

The written examination for the Assistant grade will be in the following subjects: Mathematics (including statistics), chemistry, biology, physics, basic in the candidates' specialty and advanced in the candidates' specialty.

The written examination for the Senior Assistant grade will be the same as for the Assistant grade with the exception of mathematics which is omitted.

Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Bethesda Station, Washington 14, D. C., and should be applied for immediately. Oral examinations will be held at the Marine Hospitals of the following cities on date listed: Kirkwood, Mo., Sept. 24; Chicago, Ill., Sept. 25; Detroit, Mich., Sept. 26; Baltimore, Md., Oct. 1 and at the U. S. Public Health Service Dispensary at Fourth and D streets, Washington, D. C., Oct. 3.

Entrance pay for Assistant grade with dependents is $3411 a year and for Senior Assistant grade with dependents is $3991 a year. Promotions are at regular intervals up to and including the grade of Medical Director which corresponds to full Colonel at $7951 a year. Retirement pay at 64 is $4500 a year. Full medical care including disability retirement at three-fourth's pay is provided. All expenses of official travel are paid by the Government. Thirty days' annual leave with pay is provided.

Graduates of accredited veterinary colleges are eligible to take this examination for appointment as scientific officers in the Regular Corps, U. S. Public Health Service.

An applicant must fulfill the qualifications set forth in paragraph four of the foregoing notice which includes seven years of education or experience for the assistant grade. For veterinary applicants this may consist of five years veterinary education plus two or more years of any other college education he may have had of undergraduate or graduate level, or experience in practice, research work or public health activities.

Scientific officers who are veterinarians will have the opportunity to do research work with the National Institute of Health, or to be assigned to field activities which will utilize their knowledge to the best advantage. The latter, for example, may consist of developing milk, meat and food sanitation programs; and the study of the relation of animal diseases to public health.

Vitamin D Patents Invalid

Ligitation involving the validity of the patents held by the Wisconsin Alumni Research Foundation for fortifying food and feed products with Vitamin D by exposure to ultraviolet light has been in the courts for a number of years. June 11 the United States Supreme Court denied the Foundation's petition for a review of a lower court decision holding that all vitamin D patents held by the Foundation are invalid and that the licensing system by which food and feed processors were permitted to use this method of irradiating their products is not in the public interest.

Penicillin Causes Changes in Blood Clotting

Discovery of a change in blood clotting caused by penicillin, pointing both to possible danger and possible further benefits from the mold chemical, is announced by Maj. Leon F. Moldavsky, Capt. William B. Hasselbrock and Lt. Carlos Cateno of Harmon General Hospital. (Science, July 13). Private Darrell Goodwin gave technical assistance in the studies.

The danger is that of thrombus or clot formation in the veins of patients getting penicillin, especially with the recent tendency to use larger doses.

The benefit would be use of penicillin in bleeding disorders such as hemophilia, though that hereditary bleeders' disease is not mentioned in the report.

Penicillin, it was found, speeds coagulation of the blood to such an extent that sometimes blood taken from a patient for study clotted in the syringe before it could be expelled.

"Even more startling" they report, is the change caused in the nature of the blood clot itself when penicillin has been given. The blood clot does not retract. The blood itself is dark and exceedingly viscous in its flow. When coagulation is complete it appears solidified, looking like an artificially produced, solid thrombus or blood clot.—Sci. News Letter.
A. V. M. A. Executive Session

Sessions of the Executive Board and of the House of Representatives of the A. V. M. A. were held in Chicago Aug. 20-21 in lieu of the regular annual meeting which was proscribed by rules of the ODT. The usual business of an annual meeting was conducted, including receiving reports of officers, committees and representatives.

Among the actions taken was approval of amendments to the constitution and administrative by-laws broadening the scope of the committee on proprietary pharmaceuticals and changing its name to committee on therapeutic agents and appliances, and changing the name of the committee on education to council on education, enlarging and increasing its memberships and prescribing its duties.

Proposed amendments were received and reserved for action upon at the next meeting, providing for: (1) dispensing with the member of the Executive Board and substituting the immediate past president, (2) Incorporating the Republic of Mexico in Zone 3 of the appointment map for conventions and (3) requiring that future applicants for membership be members of their respective constituent state of provincial or other association and providing for associate membership in the A. V. M. A.

Committee Reports

Committee on Postwar Planning: Only 58% of those now in the Army Veterinary Corps expect to engage in practice when discharged from the military service. Twelve per cent expect to take up food inspection; 10% teaching and research; 1.57% biological work and 17% miscellaneous veterinary activities. Approximately 85% expect to take “refresher” courses upon discharge and nearly 15% desire to do graduate work.

Committee on Diseases of Swine: The greatest opportunity for increasing pork output consists in “raising to market age a greater percentage of the pigs farrowed.” Among the major enemies of meat production are hog cholera, swine erysipelas, pig scours, anemia and swine brucellosis.

“Brucellosis is becoming more prevalent. The incidence of this disease is now from 1 to 3% in swine going to slaughter. If brucellosis is discovered in commercial breedings herds the entire breeding stock should be sent to slaughter.”

The chances for survival of baby pigs is greatly increased when the sows are fed better rations during pregnancy.

Committee on Diseases of Dairy Cattle: Synthetic sex hormones are not the answer to the farmer’s prayer for more dairy calves and more milk production. Although injection of these hormones has caused virgin heifers to start giving milk and has prolonged the reproductive ability of farm animals, they have often been over-rated. Their use is surrounded with many dangers unless safeguarded by veterinary supervision.

In their endeavor to supply the increased demand for milk many farmers are robbing their new-born calves of feeding elements needed to give them a good start in life.

“Nature intended that the calves should get all the colostrum because it is ten times as rich in protective substances as normal milk. Unfortunately, the dairyman has interfered with nature to such an extent that few calves get enough colostrum to meet their needs. It becomes necessary to feed vitamins in concentrated form. Vitamin A deficiency in a calf causes watery eyes, a cough, pneumonia and scours. Vitamin B deficiency leads to flabby muscles, and digestive stagnation. Vitamin C is needed for the proper function of the guard cells in the intestine and Vitamin D helps to prevent rickets.”

The committee also warned against farmers looking upon udder injections as a panacea in controlling mastitis. Sanitation and proper milking practices are equally as important in combatting this disease.

Committee on Diseases of Wild Animals: Disease-carrying wild animals and birds are a constant threat to both domestic animals and man in this country. Wild animals carry and spread rables, tuberculosis, and other common maladies.

“Rabies has been occurring in such frequent outbreaks that workers have concluded that it is constantly present in some areas and periodically assumes epizootic proportions in foxes, coyotes and other animals.” Attacks by rabid foxes and other lesser animals on man have been reported.

“The virus of encephalomyelitis has been recognized in a wide range of wild birds and mammals. Several of these may be reservoirs for the virus and responsible for the outbreaks among horses.

“Tuberculosis has frequently been diagnosed in deer, foxes, other wild mammals and birds, including wild ducks and pheasants. The wild-life was probably originally infected from domestic stock or man.
“Never in the history of America has there been an adequate program for the control and investigation of diseases in wild species, for they may transport infectious organisms of all kinds from one area to another. Never has there been a greater need for an adequate program for disease control in all animal life, in order to conserve the production of meat and other animal products.”

Committee on Diseases of Sheep: Internal and external parasites are probably the causes of the greatest economic loss in farm flocks of sheep. Pregnancy disease warrants further study. Evidence is accumulating that vitamin A deficiency leads to the birth of weak lambs which are susceptible to navel infections and enteritis.

Poisonous plants are responsible for the greatest death loss among range sheep. Progressive pneumonia and stiff lamb disease are also important.

Hemorrhagic septicemia, coccidiosis and contagious ecthyma exact a heavy toll incident to the shipment of feeder lambs. Enterotoxemia and urinary calculi cause much loss in feedlot lambs.

Committee on Brucellosis: Indiscriminate vaccination of adult cows may seriously hamper the nation’s fight to stamp out brucellosis in the country.

“Testing, gradual elimination and systematic vaccination, together with sanitary measures, are probably our most widely applicable plan of control.”

Swine Brucellosis is on the increase in this country, and is causing serious losses to farmers. “We cannot be reminded too frequently that the swine brucellosis organism is highly pathogenic for man.”

Committee on Diseases of Beef Cattle: “To date artificial insemination has not offered competition that has seriously affected the bull market, but the fact remains that it carries with it a potential threat, especially in the lower price brackets. However, it can be assumed that the price of most desirable animals will be increased.”

In artificial insemination, the committee report shows that a high grade semen fluid can be diluted as much as 50 times—thus greatly extending the value of outstanding bulls used for artificial insemination. As a result of this method great good has already been experienced in the improvement of breeds, milk production, and financial status of herd owners.

Advisory Board, Horse and Mule Association: The horse has saved the day for wartime food production in this country.

“Only about 4.5% of all American farms are dependent upon mechanical power alone. Had it not been for the horses and mules on American farms we would have had not nearly the farm production attained at present. Horses and mules do all the work on 53% of the American farms and part of the work on 18% of the farms where tractors are used also.

Committee on Interstate Shipment of Livestock by Truck: Shipment of livestock and poultry by trucks, without sanitary restrictions, is posing a serious threat of disease outbreaks in many rural areas.

“There is no greater threat or menace to the health of livestock than the unregulated movement of livestock by truck under present wartime congested transportation. This problem is becoming more grave every year.”

The committee advocated sanitary and humane regulations covering livestock truck shipments, similar to those now in effect for shipment of stock by rail.

“It is the opinion of the committee that this matter should be submitted to the Congress for investigation and disposal.”

Committee on Rabies: Three steps were recommended to help control the widespread outbreaks of rabies which have caused many deaths among persons and animals this year: (1) licensing of all dogs, impounding and disposal of all stray dogs, (2) immunizing by vaccination of all dogs in areas where rabies has been established and allowing special privileges to immunized dogs 30 days after immunization, (3) showing on the shipment certificate given by the veterinarian, if the dog comes from an area where rabies has been present, in case the animal is being shipped interstate.
Committee on Parasitology: There are so many parasites now preying on America's animal population, it was recommended by the committee that the Department of Agriculture prepare a special check list of animal parasites by states, single out those which constitute major problems in each area and aid in a national drive to eradicate them. The committee also recommended that veterinary schools give increased attention to the study of parasites and the losses caused by them among the nation's livestock and poultry.

Committee on Education: America may experience a shortage of veterinarians after 1948. The drafting of young men for military service and the non-deferment of pre-veterinary students has reduced enrollment sharply in American veterinary colleges, the association's committee on education reported. The committee believes the decrease in enrollment will be even more pronounced in 1946.

It is recommended that 12 colleges be accredited for the coming year—Alabama Polytechnic, Colorado State, Ecole De Medecine Vétérinaire of Montreal, Iowa State, Kansas State, Michigan State, New York State, Ohio State, Ontario Veterinary College, University of Pennsylvania, Texas A & M and Washington State.

Committee on Food Hygiene: Better and more wholesome meat for the public after the war was predicted by this committee.

"Refresher Courses" are advocated for the continued improvement of the methods used by veterinary inspectors, responsible for the inspection of meats at the nation's large packing plants. Packers and veterinary colleges are urged to cooperate on the project.

More widespread inspection of poultry killing plants to insure more wholesome poultry meat for the public after the war was also foreseen in the committee's report.

Committee on Milk Hygiene: Disease-free dairy herds are now paying big dividends to farmers according to a study of 10,500 dairies. Production per day increased 40% in 10 years. In those herds which were subjected to annual physical examination of all dairy cows and received the benefits of concurrent programs and recent advances in feeding and management which accompanied such examination.

"This is only more evidence to substantiate our claim that a disease-free herd must be maintained before high quality products and adequate financial returns can be obtained by the dairyman.

Committee on Nutrition: Nearly every section of the United States possesses soil peculiarities which cause one or more nutritional deficiencies in animals in certain areas of those localities.

"Soil fertility, rainfall, erosion, leaching, climatic conditions and soil composition are all vitally concerned in profitable animal production and feeding. The swine belt, cattle country, milk sheds, etc., were not arrived at by accident, but have grown up party because of nutritional facilities present in these particular sections."

The committee reported that there has been a sharp increase in nutritional deficiencies in livestock raising of recent years and that the present livestock feed shortages in some areas are not so much a result of lack of sufficient feed, as to wartime transportation difficulties which make it impossible to ship needed supplies from one area to another.

Joint Committee on Foods: The official "seal of approval" which certain dog foods have been given will be awarded on a different basis in the future.

Heretofore, the association's committee, working jointly with the American Animal Hospital Association, has employed its own research laboratory to test the ingredients and feeding value of all dog foods submitted to it. In the future dog food manufacturers applying for the seal of approval must submit analyses and test data from reputable, independent research laboratories rather than relying upon the association's committee to conduct such tests. The committee will then check and evaluate the various foods submitted on the basis of the analyses and test data supplied, and either grant or withhold approval according to its findings.

The dog food testing program has been much improved by revision. It is still objectionable since by whatever name the charge is called the seal holder will still be required to pay money to the committee to get a seal for his dog food and the committee still solicits the applications for seals on a commercial basis.

The price paid by the manufacturer has been reduced about 80%—from approximately $1000 to $200, which is an $800 improvement but not enough. Perhaps the second most important fault is the continued failure to publish or adopt a standard that an approved dog food must attain or that would automatically eliminate poor foods and thus make the seal attractive to manufacturers of high class foods. Standards are set only if the manufacturer chooses to advertise his prod-
uct as a "complete ration" or a "maintenance ration." For the former it must successfully meet a one-generation test, in the latter it must maintain an adult dog for an unspecified time. It is a bit difficult to see why a dog food that will not meet these exceedingly moderate standards should receive a seal of approval, even if the manufacturer made no claims for it.

Far stricter control of the claims made in advertising of approved foods than has here-tofore obtained is proposed in the revised program—a big improvement.

**Awards**

Dr. L. A. Merillat of Chicago, editor of the Journal of the American Veterinary Medical Association, was named by the Association’s special awards committee to receive the Twelfth International Veterinary Congress Prize, highest award in veterinary medicine.

The award was presented "for life-long distinguished service to veterinary medicine as an accomplished surgeon, inspiring teacher, honored leader and organizer of military veterinary service and renowned author and editor."

During the first world war, Doctor Merillat was chief veterinarian of the 1st Army during the St. Mihiel and Argonne offensives and, as a result of his service in collaboration with the French Army, he was made a Chevalier of the French Legion of Honor in 1919. He also served at different times on the faculties of the McKittrick Veterinary College and the Chicago Veterinary College. He engaged in practice for many years and is the author of several standard books on veterinary science, one of which has been translated for use in foreign countries.

Doctor Merillat entered the Ontario Veterinary College 59 years ago and has been actively engaged in one or more veterinary activities continuously since that date. He has served both the A.V.M.A. and the Illinois V.M.A. as president and as secretary and has filled numerous important committee assignments in both associations, in addition, he has contributed to the programs at several hundred association meetings.

In response to the presentation Doctor Merillat said in part that he considered the award a compliment to clinical veterinary medicine; that the application of veterinary science had been his main life work; that all the other things mentioned by president Farquharson in presentation of the award were simply accessories to the main issue which was improvement of clinical veterinary medicine; that his long effort to improve the standards of veterinary education in this country had as its object a better trained personnel for the application of veterinary science; that discoveries in veterinary medicine and progress in veterinary science have little meaning unless there be a trained personnel competent to apply the new knowledge developed. His association with clinical veterinary medicine had been so intimate that while he deeply appreciated the great honor that had been done him he could not but regard it as a compliment to clinical veterinary medicine and not to a person.

WILLARD L. BOYD

The $1,000 Borden award and gold medal for the most outstanding research on dairy cattle disease problems was presented to Dr. Willard L. Boyd of the University of Minnesota.

In presenting the award it was pointed out that Doctor Boyd has been the author or co-author of more than 30 scientific papers on research in dairy cattle disease problems, including "notable contributions on sterility and other breeding diseases, bovine brucellosis, nutritional, and other cattle diseases. His research has been outstanding in the dairy field."

Doctor Boyd was also a member of the editorial board of the A.V.M.A. publication. To Dr. Boyd was a great credit. The A.V.M.A. has long been interested in veterinary research, and Doctor Boyd and his associates have conducted a number of experiments which have resulted in important advances in our knowledge of this crucial field of applied science. Doctor Boyd has also contributed to the programs of the A.V.M.A. The $1,000 Borden award and gold medal for the most outstanding research on dairy cattle disease problems was presented to Dr. Willard L. Boyd of the University of Minnesota.
nutritional diseases and their effect on dairy cattle reproduction and similar conditions." His research in these fields has been carried on over a period of more than 25 years.

Doctor Boyd is chief of the veterinary division of the University of Minnesota, and is also Chairman of the Committee on Education of the American Veterinary Medical Association. The Borden Company, which presents this award annually through the American Veterinary Medical Association, also makes similar awards in dairy science, biological chemistry, home economics and poultry science. It has already announced that the award for veterinary research will be given again next year.

The association's annual "Humane Act" award was voted to Arnold "Tim" Suter a 16-year-old boy of Pittsburgh for saving the life of a dog injured by a hit-and-run motorist. In trying to drag itself away from the scene of the accident, the dog fell into a 12-inch sewer. Police were unable to extricate it. Tim found an 18-inch sewer opening further down the street, and crawled for two hours through mud and water to reach the dog and drag him back. Tim was so weak when he brought the dog to safety that he had to be pulled from the sewer by the crowd of bystanders.

Resolutions

Attacking the suggestion that America lift the ban on postwar meat imports from nations where dangerous livestock diseases exist, the association adopted resolutions urging retention of present controls on such imports.

"Any step lessening safeguards that apply to importations of live animals or dressed meats or unsterilized meat food products from countries where foot-and-mouth disease, rinderpest, contagious pleuropneumonia, or other disease threats exist, would constitute a grave hazard to our livestock industry and our present and future food supply."

The resolution instructed the association to appeal to Congress to strengthen present import regulations in order to guard American livestock against the possibility of foreign animal plagues entering from countries where these diseases are enzootic.

A warning against the promiscuous sale of vaccine and similar products which contain live disease germs was also sounded in the resolutions adopted. "The sale of biologics that contain living organisms, if not properly used, may spread disease to livestock with possible fatal results. The promiscuous sale of such biologics and drugs is a disservice to the livestock industry, and to the public which consumes the meat, meat products and dairy products of our livestock industry."

Presidential Address

A new era of food abundance, resulting from better and healthier livestock for America after the conclusion of peace is envisioned by Dr. James Farquharson, president of the association.

"New developments such as penicillin, DDT, sulfa drugs, nutritional advances and new technics in veterinary surgery will be of great help in our fight against livestock disease losses.

"America is already the safest place in the world for livestock production—but the picture will be brighter in the years ahead. Another help will be the expected early release from the Army of over 2,000 veterinarians who have been serving in the Army Veterinary Corps. On their return to private practice, these men will again take their places in the continuous fight to prevent livestock losses."

America's allies will also benefit from American methods after the war, thanks to the work of our veterinarians who have been serving overseas, in the veterinary corps.
"American veterinarians have achieved remarkable results in helping some of these foreign countries to cope with livestock disease problems. In Italy they have set up the American system of hog cholera vaccination, resulting in the saving of thousands of swine which otherwise would have died of this disease. Our special American strain of vaccine to combat bovine brucellosis was sent to the British Isles. In the Orient, American veterinarians have instituted control methods to deal with some of the tropical diseases which formerly took a severe toll among flocks and herds."

Doctor Farquharson predicted the need for many more veterinarians in this country after the war.

"Our surveys show that more veterinarians will be required in public health work, food inspection, research, government service and in private practice as well. Many marginal and sub-marginal livestock raising areas have not had the veterinary service they needed in the past, and authorities are now studying ways and means of providing veterinarians for these regions. The veterinary colleges report that many returning soldiers have applied for entrance under the GI bill.

"All this, of course, means better livestock production in this country, better profits for the farmer, and better food in greater abundance for the American people."

Future Meetings

Toronto was selected as the site of the 1947 convention. The location for the 1946 annual convention was not chosen but will be selected later by the Board of Governors. According to the adopted schedule it is due to go to Zone 2 (east of Ohio and north of North Carolina).

More Beef from Crossbred Cattle

Crossbred beef cattle produced by combinations of both two and three breeds yielded slightly more beef and profit per animal than comparable purebred stock, the U. S. Department of Agriculture found in experiments conducted at its range livestock station, Miles City, Mont. However, the benefits are offset in part by the need for separate pastures to keep the foundation breeding stock and the different crosses apart, especially during the breeding season. The studies, which covered several years, were in cooperation with the Montana Agricultural Experiment Station.

The calves of the two-way cross were the offspring of Shorthorn bulls and Hereford cows. The calves of the three-way cross were sired by Aberdeen Angus bulls bred to Short-horn-Hereford cows, the product of the former cross. The final results were for the three-breed combination which showed that, in comparison with purebred Herefords, these triple crosses weighed more at weaning and at the end of the feeding period, gained more rapidly in the feedlots, sold for more per pound and per head, had a higher dressing percentage and returned more per animal above feed and marketing costs. During the first year the average market return for the crossbred steers was $15.10 greater than for the average purebred steer and for the second year it was $10.49 greater.

The authors of the report, A. L. Baker and Bradford Knapp, Jr., conclude that systematic crossing of good specimens of the three breeds of cattle should be profitable where conditions are favorable for handling cattle in this manner. A plausible explanation for the better performance of the crossbred cattle is the hybrid vigor that often accompanies crosses between established breeds.

Applies to Animals Too

The best place to be healthy is a healthy community, but healthy communities do not just happen. They are made that way by application of measures that are well-known and well-proved.—Paul B. Brooks, M.D.

Refresher Course at Pennsylvania

The University of Pennsylvania, School of Veterinary Medicine, will receive applications from veterinarians who desire to take a refresher course. Applicants are requested to state the subjects in which they are especially interested. The length of the course, date of beginning and schedule of classes, registration fee, etc., will be announced later. For further information write Dean G. A. Dick.

Veterinary Inspectors Wanted

The federal Bureau of Agricultural Economics, which conducts the veterinary inspection of poultry at poultry slaughtering and poultry canning establishments has 17 vacancies for which inspectors are desired immediately. The positions are under civil service and are permanent. The starting salary is $2900 but promotion is rapid to $3200, thereafter the pay increase is $100 per year until maximum for the grade is received. Overtime pay is earned for work on Saturday at the option of the employee. Veterinarians interested in these positions should write H. A. Weckler, Room 910, 600 South Canal St., Chicago.
The 113th Medical Service Company (Veterinary)

The 113th Medical Service Company, the Veterinary Detachment for the South Sector of Oahu under the Hawaiian Department when the Japanese attacked Pearl Harbor, appeared to have poor prospects for any important role in the war in December, 1941, for the conflict in Poland, the Low Countries, France, north Africa and Russia had demonstrated that mechanized forces and airpower would dominate the world's battle fields, and the veterinary corps was established to care for the Army's horses and mules.

The conflict in the Pacific brought many perplexing problems, and it was this company which solved most of the questions about the best methods for protecting foods from spoilage. Singly, in pairs and in small groups, the men of this unit traveled south to New Zealand and New Guinea and west to the Philippines and the Ryukus to determine what conditions must be met and to advise on ways for conserving the tremendous quantities of foods needed by the Army.

The results speak eloquently of the accomplishments of this veterinary service company, for largely as a result of their technical skills and hard work more than 99½% of the food products of animal origin handled in the Pacific Ocean Areas were kept in nutritious and appetizing condition.

In recognition of these outstanding accomplishments the 113th Medical Service Company (Veterinary) recently was awarded the Meritorious Service Unit Plaque by Maj. Gen. Henry T. Burgin, commanding general, Central Pacific Base Command, "for its superior performance and outstanding devotion to duty in the performance of several exceptionally difficult tasks and for its achievement and maintenance of a high standard of discipline."

During the three-year period from January 1, 1942, to December 31, 1944, this unit's food inspection and conservation, food security supervision, animal quarantine activities, war dog service, Signal Corps pigeon service and training of veterinary personnel for Army Garrison Forces in the forward Pacific Ocean Areas established these records:

<table>
<thead>
<tr>
<th>Description</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods of animal origin inspected</td>
<td>734,634,693</td>
</tr>
<tr>
<td>Foods of animal origin inspected upon arrival</td>
<td>328,553,330</td>
</tr>
<tr>
<td>from Mainland or procured in the Hawaiian Islands</td>
<td></td>
</tr>
<tr>
<td>Foods of animal origin inspected upon shipment</td>
<td>198,371,994</td>
</tr>
<tr>
<td>from Oahu to forward areas in the Pacific Ocean</td>
<td></td>
</tr>
<tr>
<td>Foods of animal origin inspected upon issue</td>
<td>161,334,676</td>
</tr>
<tr>
<td>to troops for rations</td>
<td></td>
</tr>
<tr>
<td>Foods of animal origin inspected in storage, at</td>
<td>3,170,563</td>
</tr>
<tr>
<td>reclamation centers</td>
<td></td>
</tr>
<tr>
<td>Foods of animal origin condemned as unfit for</td>
<td>404,591</td>
</tr>
<tr>
<td>human consumption</td>
<td></td>
</tr>
<tr>
<td>&quot;Ready-made&quot; sandwiches inspected</td>
<td>9,783,294</td>
</tr>
<tr>
<td>Soft drinks inspected, prior to sale to military</td>
<td></td>
</tr>
<tr>
<td>personnel at Post Exchanges</td>
<td>376,383,787</td>
</tr>
<tr>
<td>Inspected 7,359 dogs offered by civilians of the</td>
<td></td>
</tr>
</tbody>
</table>

Officers and enlisted technicians of the 113th Medical Service Company (Veterinary), assembled to receive Meritorious Service Unit Plaque

Signal Corp, U.S. Army
Territory for use as war dogs; subjected 3,259 of these dogs to Army veterinary physical and health inspection; passed 815 dogs as free from communicable diseases or physical unsoundness; provided veterinary care for demilitarization of 699 War Dogs and returned the animals to their owners; planned original organization and shaped initial operational policies of the War Dog Training Center.

Provided veterinary care, treatment and technical supervision of birds of a Signal Corps Pigeon Company which had been serving at many scattered points throughout the Pacific Ocean Areas; minimized incidence of respiratory infections, especially coryza, among birds by development of an open-front loft especially designed for this area; vaccinated squabs when two weeks old, thus eliminating pigeon pox as a disease problem.

All veterinary officers and enlisted personnel of the Veterinary Sections in the Surgeons' Offices of Army Garrison Forces on Christmas Island, in the Hawaiian, Mariannas and Marshall Islands, on Iwo Jima and in the Ryukus were given training by personnel from this company in veterinary administration, military food technology, animal sanitation and disease control.

The veterinary policies and operational procedures now existent in the forward areas have been influenced largely by those which were practiced in the South Sector of Oahu during the past three years by the 113th Medical Service Company. In addition, the animal quarantine policies adopted by this company, in cooperation with Territorial and Federal officials, has prevented introduction into the Hawaiian Islands of many diseases from Japanese occupied areas.

The Anti-Bacteriological Program developed by this unit for complete and efficient security supervision over all commercial food establishments on Oahu has been adopted by the War Department as a model for other theaters. Under this program the 113th Medical Service Company inspected all commercial food establishments selling ice cream, bottled soft drinks, milk and “prepared” sandwiches to military personnel. The record shows that since this program went into effect no cases of food poisoning of military personnel, or among the civilian populace, traceable to sabotage or contamination of these foods were reported.

In supervising, in an advisory manner, the storage, handling, care and rotational procedures for subsistence stores, losses of foods have been reduced below pre-war experience and much below expected levels, by this company. Emphasis is placed by the personnel of this company upon sanitary condition of conveyances and storage facilities, proper refrigeration and thorough examination of all products and containers.

Throughout all its activities, the personnel of this company has acted with considerable professional pride, without the close supervision usually given in units of all branches of the service. Seldom do the members of the 113th Medical Service Company meet, for their duties keep them scattered at the areas where they work. One of the few times so many of the men were gathered together was the Sunday morning when the company assembled to be presented with the Meritorious Service Unit Plaque. On that occasion, Gen. Burgin expressed great pride in having this company in his command and complimented the personnel on the proficiency with which they had accomplished their military missions.

The 113th Medical Service Company (Veterinary) is commanded by Major Raymond R. Houser, Findlay, O.
OCTOBER, 1945

German Veterinary Service Reestablished

Reorganization of the civilian veterinary profession is regarded as a highly important phase of German economic rehabilitation in the area occupied by the Seventh Army.

"The Army's effort," says Colonel D. S. Stevenson, Seventh Army Veterinarian, "is directed toward reestablishing the closely knit and highly efficient veterinary service which existed in pre-war Germany, because of the long range effect it will have on the forces of occupation."

"When Germany went to war," the colonel continued, "a large number of veterinarians were called into the Army and this depletion of the normal civilian service contributed to the increase of disease in farm animals. German veterinary officials report, for example, that the incidence of tuberculosis ranges from 25 to 50% among the cattle in the Seventh Army's occupational zone."

Army veterinarians, seeking quick reestablishment of the civilian profession, sought early release of veterinarians from prisoner of war camps. Reorganization of German veterinary service under close supervision of the Army is given a high priority in plans for German economic rehabilitation and is gradually taking place.

The civilian veterinarians treat the various animal diseases in the many farming communities throughout Seventh Army's zone. When they find a need for preventive vaccines or serums they file their requests with a central clearing point in the district. There a German "head veterinarian" determines the need for certain biologics, and his findings are in turn scrutinized by an Army veterinarian whose recommendations are final.

A request for the biological products the purchase of which is approved is then filed with the I. G. Farben serum plant at Marburg, which is operated under Army supervision.

"Since we have taken over," said Colonel Stevenson, "there has been one serious outbreak of swine erysipelas among approximately 3,000 hogs in our zone. That outbreak was suppressed promptly; an important thing when one considers the food situation. With winter coming on we feel that all we can do to alleviate a food shortage will make the governing job easier for the Army."

The colonel, who lives at Cochran Road, Lexington, Kentucky, explained that cattle, and to some extent horses, serve two purposes— for transportation and for food in so far as German economy is concerned. He added that a survey in Seventh Army's zone showed that at least 50% of civilian transportation was provided by animals.

"It is therefore doubly important that we do our utmost to prevent animal epidemics," he explained. "The same cow which provides civilians with milk also helps pull a wagon or a plow. These cows must work because the province of Baden has a shortage of 100,000 work horses at present, according to German reports."

The colonel said there was no thought of providing fresh milk for troops from German herds. The tuberculosis rate among milk cows is high and the cows being scattered one or two to each farm instead of being collected in herds of considerable size as is the case in the United States, the task of eliminating tuberculosis from them, or even of locating all affected herds will take years.

A half-million wounded American soldiers were evacuated from continental Europe to the 99 United States hospitals and five big convalescent camps in Britain following D day. The mortality among all patients in these hospitals was 0.26% of the total admissions (sick and wounded). Approximately 61% were returned to duty.

Citation of Legion of Merit

Colonel Wayne O. Kester, V.C., U. S. Army, received an award of the Legion of Merit August 12, 1945, by direction of the President and by command of Lieutenant General Richardson, for exceptionally meritorious conduct in the performance of outstanding services from 7 December 1941 to 1 June 1945.

The award states: "As South Sector Veterinary Food Inspector and, subsequently, Veterinarian, Headquarters, United States Army Forces, Pacific Ocean Areas, Colonel Kester planned for and expedited the application of preventive measures which safeguarded food supplies and minimized the incidence of animal diseases affecting troops and civilians. Through his specialized medical and military knowledge, diligence, and unwavering devotion to duty, Colonel Kester made contributions of the greatest value to the welfare of the civil populace and the military of the Pacific Ocean Areas."
The History and Distribution of Anthrax in Livestock in the United States

ANTHRAX is recognized as one of the oldest and one of the most destructive diseases of animals recorded in history. Its ravages in both man and animals date back to Medieval Times and its origin is lost in antiquity. Before the disease was known to be of an infectious nature and proper measures were taken to control it, the malady was prevalent in many parts of the world and took a heavy toll among human beings and caused great losses of livestock in many countries.

Anthrax has world-wide distribution. It exists in certain areas on all the continents and occurs from the tropics to the polar regions. Although the incidence of the disease in livestock in some countries has been reduced greatly by rigid enforcement of adequate control measures, it is still prevalent in many parts of the world.

The world-wide distribution of anthrax and the difficulty encountered in suppressing it is not surprising, when the marvelous tenacity of the anthrax spore, the long life of the organism in the soil and the persistence of the infection in animal products and other material contaminated with it, are considered.

Dissemination of Anthrax

Anthrax is spread from one country to another principally through infected animals and the interchange of infected objects closely associated with animal life, such as hides, hair, wool, bonemeal, fertilizer, forage and other materials.

When anthrax is once established in an area, it may spread to adjoining localities and even to distant points (1) by contamination of soil, drinking water and pasture plants with discharges of diseased animals, (2) by dogs, coyotes and other carnivora, (3) by carrion-eating animals and birds—especially buzzards, (4) by flies and possibly other types of insects and (5) by streams contaminated with surface drainage from anthrax-infected soil.

Early History of Anthrax in the United States

The very early history of anthrax in the United States is rather obscure. The exact time and manner in which it was first introduced into the United States is not definitely known. Authentic references covering this subject are very meager.

Williams1 has suggested the probability that the infection from the valley of the Nile was introduced to the coastal plains of the Mississippi Delta by ships from the old world clearing their cargoes through Gulf ports and that the disease may have been spread along the Rio Grande by the activities of early Spanish troopers and adventurers.

In Louisiana, Carpenter2 traced the disease back to the time of its settlement by the French and believed that in America the infection was first observed in deer on the salt marshes near the mouth of the Mississippi. He reported that outbreaks in cattle of a disease believed to be anthrax occurred annually and that by 1835 it existed in all parts of the State. Baldrige3 reported an extensive epidemic in Louisiana in 1851—believed to have been anthrax—affecting both men and animals and, at this early date, mentions that the infection was transmitted from animals to man by fly bites. Bulletin No. 44, Louisiana state experiment station, issued in 1896, also mentions the occurrence of the disease soon after the settlement of the state and records outbreaks in 1884 and again in 1896.

According to Pennock4 in 1834, a disease believed to have been anthrax was prevalent in cattle fed on the Common near Philadelphia and the first reported cases of anthrax in the United States occurred in persons in that city from skinning the carcasses of such animals.

Williams mentions the occurrence of outbreaks in Texas as early as 1868 and later in 1880. Forbes5 reported in 1894, that the disease had existed for 50 years in 17 counties in the low-lying coastal areas in Texas. Wray who made field investigations of outbreaks in the Yazoo bottom lands of western Mississippi in 1889-1890, concluded, from reports gathered during his investigation, that the disease had existed since 1868 in that area. He definitely proved the existence of the disease in Mississippi by recovering B. anthracis from blood specimens collected from animals. Andrews mentions outbreaks of a disease in animals in Mississippi as early as 1834 and at intervals thereafter, which are believed to have been anthrax, with particularly virulent outbreaks in 1865 and 1867, resulting in heavy losses of livestock. He also mentions an epidemic of anthrax in cattle in Wisconsin in 1899 in which five persons contracted the disease in skinning cattle.

*Pathological Division, Bureau of Animal Industry, Agricultural Research Administration, Washington, D. C.
Law\(^9\) reported outbreaks in New York, in Cattaraugus County, as early as 1881 and later in Onondaga County in 1884.

Outbreaks in Vermont, Massachusetts, New York and Texas in 1887 and in California in 1888 and 1889 are recorded in the Annual Reports of the Bureau of Animal Industry, U. S. Department of Agriculture, 1887-1888, pp. 496-498.

Dawson\(^10\) reported outbreaks in Delaware as early as 1892 but believed it highly probable that the disease existed there at a much earlier date. He also estimated that infected territory comprised about one-third of the total area of the state. Law\(^8\) also mentions the prevalence of anthrax since 1892 along the banks of the Delaware River for a distance of 40 miles in New Jersey and Delaware due to contamination with infected waste products from imported hides in the Morocco leather industry along this river.

A point of considerable interest in connection with the early history is that infected areas still exist in most of the above-mentioned states.

**Purpose of Investigation**

The American Veterinary Medical Association committee on vital statistics, in a recent report\(^11\), has pointed out the desirability and importance of collecting and compiling vital statistics on animal diseases. With the exception of rables, equine encephalomyelitis, tuberculosis and brucellosis, little or no data on the nation-wide incidence of infectious diseases of animals is available.

Since anthrax, primarily a disease of animals, is essentially a soil infection, and from an economic and public-health standpoint one of the most serious diseases with which the livestock industry and the veterinary profession has to contend, it would appear highly desirable to have authentic vital statistics available on this disease in livestock. Data on human anthrax and fatality in the United States have been reported at intervals from 1915 up to the present time by Smyth,\(^12\) Chairman of the Committee on Anthrax, Industrial Hygiene Section, American Public Health Association.

While certain large well-defined areas in the United States which exist which are recognized as anthrax districts where the disease constitutes a perennial problem, the exact location of these areas and the prevalence and distribution of the disease in other sections of the United States are not generally known.

In order to obtain as complete and as accurate a picture as possible on the history and distribution of anthrax in livestock in the United States during the past three decades, the writer made a careful study of reports of the U. S. Livestock Sanitary Association, the reports of state livestock sanitary commissions, reports and records on file in the Bureau of Animal Industry and the available literature dealing with anthrax outbreaks covering the period from 1915 to 1944, inclusive. The statistical material presented in this paper on the incidence of anthrax in livestock is based on an evaluation of the data collected and compiled from this study.

Due to the difficulty of obtaining complete and accurate information on anthrax outbreaks from all the states and the possibility of errors in diagnosis, the data contained in this report cannot be considered 100% accurate. However, based on the information available, an effort has been made to present a picture as comprehensive as possible, on the incidence of anthrax in animals in the United States from 1915 to 1944, inclusive.

For further elucidation there are also included in this report Table No. 1, which gives the distribution of anthrax outbreaks by States and the number of counties involved for different periods from 1915 to 1944, inclusive. Also an anthrax map showing the counties in the various States containing areas from which anthrax outbreaks have been reported is included.

**First National Survey, 1916**

The first attempt to obtain information on the nation-wide incidence of anthrax in livestock was made by the Bureau of Animal Industry in 1916. A questionnaire was directed to the livestock sanitary official of each state requesting data on the prevalence and distribution of the disease.

Data compiled from the replies received in 1916 indicated that anthrax existed in the following 21 states with the number of infected counties shown: Alabama 2, Arkansas 10, California 23, Colorado 7, Connecticut 1, Delaware 2, Florida 2, Louisiana several counties, Maryland 2, Massachusetts 3, Minnesota 4, Mississippi 7, New Hampshire 1, New Jersey 4, New York 22, Pennsylvania 19, South Dakota several counties, Texas 41, Utah 3, Vermont 2 and Virginia 2. The following 26 States reported that the disease was not known to exist: Arizona, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, New Mexico, Michigan, Missouri, Montana, Nebraska, Nevada, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Washington, West Virginia, Wisconsin and Wyoming. No report was received from North Carolina.

The number of counties in each each state in which the disease existed in 1916 and the
total number of counties involved are given in Table I.

Second National Survey, 1926

No further attempts were made to obtain data on the nation-wide incidence of anthrax in animals until 1926, when Dr. A. W. Miller, Chairman of the Committee on Miscellaneous Transmissible Diseases of the U. S. Livestock Sanitary Association, made a report at the 30th annual meeting of the Association, December, 1928, on the prevalence of anthrax in the United States and Canada based on a survey made by the committee during that year.

These data were obtained from inquiries addressed to the officer in charge of livestock sanitary control work in each of the states and Canada. Replies, which were received from all except one of the states, indicated that no outbreaks occurred during 1926 in 25 states: Alabama, Arizona, Colorado, Connecticut, Florida, Georgia, Idaho, Iowa, Indiana, Kentucky, Maine, Maryland, Michigan, Minnesota, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oregon, South Carolina, Virginia, West Virginia, Wisconsin and Wyoming. The other 22 States reported one or more outbreaks as follows: Illinois 1, Kansas 1, Missouri 1, Montana 1, Nevada 1, Oklahoma 1, Massachusetts 2 (2 years), Utah 2 (2 years), Washington 2 (2 years), Tennessee 3, Delaware a few cases, Pennsylvania 4, New York 6, Vermont 6 (2 years), Louisiana 1, North Dakota 7, Mississippi 9 localities, Arkansas 10 townships, Nebraska 33 premises, California a few outbreaks, South Dakota 25 counties, 156 premises and Texas 5 counties. (See Table I.)

The total loss in all states was comparatively small except in South Dakota where about 800 animals died and in Texas where the loss was approximately 5,000 animals. The State Veterinarian of Texas also reported that, in one county, deer were extensively infected.

During 1926 there was one outbreak in the province of Ontario in Canada which resulted in seven fatalities.

By referring to Table I, it will be noted that anthrax was reported to exist in 21 states in the 1916 survey and in the 1926 survey outbreaks were reported from 22 states. This would appear to indicate that very little increase in infected territory had occurred from 1916 to 1926. On closer analysis, however, it will be seen that this conclusion is erroneous, since the survey made in 1926 covered outbreaks only for that year and did not include outbreaks reported in the intervening nine years between 1916 and 1926. It will also be noted that in the 1926 report, 10 states, namely, Illinois, Kansas, Missouri, Montana, Nebraska, Nevada, North Dakota, Oklahoma, Tennessee and Washington reported outbreaks that failed to report the existence of the disease in 1916. On the other hand, eight states, Colorado, Connecticut, Florida, Maryland, Minnesota, New Hampshire, New Jersey and Virginia, that reported the existence of the disease in 1916, failed to report in 1926 outbreaks as having occurred during the 9-year period.

Third National Survey, 1915 to 1932, Inclusive

A painstaking examination and review of all available records and reports covering anthrax outbreaks from 1915 to 1932 were made to obtain an over-all picture of the prevalence and distribution of anthrax during that period.

The results of these studies indicated that outbreaks had occurred in at least 41 states during this 18-year period. The seven states failing to report outbreaks were: Arizona, Georgia, Idaho, Indiana, Maine, Michigan and West Virginia. Information on the extent, location and date of outbreaks will be found in Table I.

Fourth National Survey, 1933-44, Inclusive

This survey was made to determine the prevalence and distribution of anthrax in livestock in recent years and thus obtain a comprehensive picture of the anthrax situation from 1933 to 1944. It is based on data assembled from the reports of state livestock sanitary boards and records and reports on file in the Bureau covering that period and, with few exceptions, the data have also been confirmed by state livestock sanitary officials. Furthermore, outbreaks in the following states during this period have been confirmed by laboratory diagnosis in the Bureau laboratories in Washington, D. C., or Denver, Colorado: Alabama, California, Colorado, Kansas, Maryland, Missouri, Montana, New Mexico, North Carolina, South Carolina, South Dakota, Texas, Virginia and Wyoming. The results of this survey indicate that during the 12-year period from 1933 to 1944, inclusive, outbreaks occurred in at least 405 counties in 37 states. Of the 11 states that failed to report outbreaks five of these, Arizona, Indiana, Maine, Michigan and West Virginia, have never reported the disease in livestock. However, since Smyth has reported human cases from all five of these states during the period from 1919 to 1938, it is possible that some of the cases in man were acquired directly from anthrax-infected livestock, not known to have been so affected. The other six states not reporting outbreaks, namely, Connecticut, Kentucky, New Hampshire, Ohio, Rhode Island and Washington, have previously reported the existence of...
Table I.—Incidence of Anthrax in Livestock in the United States as Shown by Surveys 1915-1944, Inclusive*

<table>
<thead>
<tr>
<th>First Survey</th>
<th>Second Survey</th>
<th>Third Survey</th>
<th>Fourth Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number counties in which anthrax existed in 1916</td>
<td>Extent of infection in 1926</td>
<td>Outbreaks 1915-1932, Incl. (an over-all picture)</td>
<td>Number counties reporting outbreaks 1933-1944, Incl.</td>
</tr>
<tr>
<td>States</td>
<td></td>
<td></td>
<td>Increase or decrease in infected area since 1916 by counties</td>
</tr>
<tr>
<td>Alabama</td>
<td>2</td>
<td>None reported</td>
<td>1916</td>
</tr>
<tr>
<td>Arizona</td>
<td>0</td>
<td>None reported</td>
<td>1916, 1923, 1928</td>
</tr>
<tr>
<td>Arkansas</td>
<td>10</td>
<td>10 townships</td>
<td>Many, some severe</td>
</tr>
<tr>
<td>California</td>
<td>25</td>
<td>A few outbreaks</td>
<td>1917 to 1931, sporadic</td>
</tr>
<tr>
<td>Colorado</td>
<td>7</td>
<td>None reported</td>
<td>1916, Hartfort Co.; one</td>
</tr>
<tr>
<td>Connecticut</td>
<td>1</td>
<td>None reported</td>
<td>Sporadic, time to time</td>
</tr>
<tr>
<td>Delaware</td>
<td>2</td>
<td>A few cases</td>
<td>Sporadic, 1916, 1923</td>
</tr>
<tr>
<td>Florida</td>
<td>2</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Georgia</td>
<td>0</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Idaho</td>
<td>0</td>
<td>None reported</td>
<td>1927, sporadic; one</td>
</tr>
<tr>
<td>Illinois</td>
<td>0</td>
<td>1 outbreak</td>
<td>None reported</td>
</tr>
<tr>
<td>Indiana</td>
<td>0</td>
<td>None reported</td>
<td>1931, 1932, sporadic</td>
</tr>
<tr>
<td>Iowa</td>
<td>0</td>
<td>None reported</td>
<td>1932, Leavenworth Co.; one</td>
</tr>
<tr>
<td>Kansas</td>
<td>0</td>
<td>1 outbreak</td>
<td>None reported</td>
</tr>
<tr>
<td>Kentucky</td>
<td>0</td>
<td>None reported</td>
<td>Many, some widespread</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Several</td>
<td>1 county</td>
<td>None reported</td>
</tr>
<tr>
<td>Maine</td>
<td>0</td>
<td>None reported</td>
<td>1922, Baltimore Co.; one</td>
</tr>
<tr>
<td>Maryland</td>
<td>2</td>
<td>None reported</td>
<td>1916, 1918, 1928</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>3</td>
<td>2 outbreaks</td>
<td>None reported</td>
</tr>
<tr>
<td>Michigan</td>
<td>0</td>
<td>None reported</td>
<td>Sporadic; time to time</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1</td>
<td>None reported</td>
<td>Many, some widespread</td>
</tr>
<tr>
<td>Missouri</td>
<td>0</td>
<td>1 outbreak</td>
<td>1935, Perry Co., one severe</td>
</tr>
<tr>
<td>Montana</td>
<td>0</td>
<td>1 outbreak</td>
<td>1917, 18, 26, 30, sporadic</td>
</tr>
<tr>
<td>Nebraska</td>
<td>0</td>
<td>33 premises</td>
<td>Many, some widespread</td>
</tr>
<tr>
<td>Nevada</td>
<td>0</td>
<td>1 outbreak</td>
<td>1917, 1921, sporadic</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>1</td>
<td>None reported</td>
<td>1915, 1916, Coose Co.</td>
</tr>
<tr>
<td>New Jersey</td>
<td>4</td>
<td>None reported</td>
<td>A few sporadic</td>
</tr>
<tr>
<td>New York</td>
<td>22</td>
<td>6 outbreaks</td>
<td>1923, Lea Co.</td>
</tr>
<tr>
<td>North Carolina</td>
<td>0</td>
<td>None reported</td>
<td>Yearly, sporadic</td>
</tr>
<tr>
<td>North Dakota</td>
<td>0</td>
<td>None reported</td>
<td>1929, Berite Co.; one</td>
</tr>
<tr>
<td>Ohio</td>
<td>0</td>
<td>4 outbreaks</td>
<td>Several sporadic</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>0</td>
<td>1 outbreak</td>
<td>1918, Brown Co., one;</td>
</tr>
<tr>
<td>Oregon</td>
<td>0</td>
<td>None reported</td>
<td>1922, Franklin Co., one</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>19</td>
<td>4 cases</td>
<td>1923, Providence Co.; one</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>0</td>
<td>None reported</td>
<td>1931, Newberry and Charleston Cos.</td>
</tr>
<tr>
<td>South Carolina</td>
<td>0</td>
<td>None reported</td>
<td>1917, 20, 22, 31</td>
</tr>
<tr>
<td>South Dakota</td>
<td>0</td>
<td>3 outbreaks</td>
<td>1928, 29, 30</td>
</tr>
<tr>
<td>Tennessee</td>
<td>0</td>
<td>None reported</td>
<td>Sporadic; time to time</td>
</tr>
<tr>
<td>Texas</td>
<td>41</td>
<td>5 counties</td>
<td>1923, Providence Co.; one</td>
</tr>
<tr>
<td>Utah</td>
<td>3</td>
<td>3 outbreaks</td>
<td>1923, Providence Co.; one</td>
</tr>
<tr>
<td>Vermont</td>
<td>0</td>
<td>2 outbreaks</td>
<td>1931, Newberry and Charleston</td>
</tr>
<tr>
<td>Virginia</td>
<td>2</td>
<td>None reported</td>
<td>1917, 20, 22, 31, widespread</td>
</tr>
<tr>
<td>Washington</td>
<td>0</td>
<td>2 outbreaks</td>
<td>1921, 3 areas</td>
</tr>
<tr>
<td>West Virginia</td>
<td>0</td>
<td>None reported</td>
<td>Many, some widespread</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>0</td>
<td>None reported</td>
<td>Sporadic; time to time</td>
</tr>
<tr>
<td>Wyoming</td>
<td>0</td>
<td>None reported</td>
<td>1923, 22, 28, sporadic</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>157 counties</td>
<td>Outbreaks in 21 States</td>
<td>405 counties</td>
</tr>
<tr>
<td></td>
<td>157 counties</td>
<td>Outbreaks in 22 States</td>
<td>405 counties</td>
</tr>
</tbody>
</table>

*Based on survey by Bureau of Animal Industry 1916.
**Based on survey by U. S. Livestock Sanitary Association 1926.
***Based on study of available records from 1915 to 1932 by author.
****Based on survey by Bureau of Animal Industry 1933-1944.
Outbreaks reported from 438 counties in 43 states.
Additional outbreaks occurred 1917 to 1944, but location not reported.
*Estimated increase of several counties.
the disease. During this period two states, Georgia and Idaho, reported outbreaks for the first time. The number of counties in each state reporting outbreaks during this period are given in Table I.

By referring to Table I it will be seen that 16 more states reported outbreaks during the period from 1933 to 1944 than on the first survey in 1916. Also at least 248 more counties in the United States reported infected areas than in 1916. Twenty-eight states reported an increase in the number of counties reporting outbreaks, nine states a decrease and, in 11 states, no change occurred in the number of counties.

An analysis of the over-all picture of the anthrax situation in livestock from 1915 to 1944 shows a gradual increase in territory involved. Outbreaks in livestock were reported from at least 43 states, involving a total of 438 counties. In this connection it is interesting to note that data reported by Smyth12 in 1941 on the prevalence of animal anthrax in the United States, based on information from state departments of agriculture, also show a gradual increase in the incidence of animal anthrax during the five-year periods reported by him from 1919 to 1938. Twenty-four states reported outbreaks in the first period, 27 states in the second, 29 states in the third and 32 states in the fourth. Udall14 in 1939 expressed the opinion that few states in this country are permanently free from outbreaks of anthrax in livestock. The areas in the United States from which outbreaks have been reported from 1915 to 1944 and the well-defined anthrax districts are shown on the accompanying map.

Severe Outbreaks in Recent Years

Widespread or severe outbreaks of a virulent nature occurred in South Dakota, Nebraska, Mississippi, Louisiana, Texas and California during the past decade.

South Dakota.—Anthrax in epizootic form occurred in this state during the summer of 1937. The disease appeared on more than 1,000 premises located in 46 counties. Previous outbreaks of a similar nature occurred in 1907, 1908, 1917, 1923, 1926 and 1932. In the 1932 outbreak the disease spread rapidly and involved territory not ordinarily considered to be in the anthrax zone. A total of 481 premises in 43 counties were placed under quarantine. The outbreak in 1923 was also of an extremely severe nature, involving practically the entire state. While yearly outbreaks occur most frequently in the counties in the badly infected territory in the southeastern part of the state, the incidence of the disease in recent years has apparently decreased, due to preseasonal vaccination.

Nebraska.—According to the Bureau of Animal Industry report contained in the Biennial Report of the State Department of Agriculture for 1940-1944, Nebraska experienced the most widespread and devastating outbreak of anthrax in the summer of 1937 ever recorded in the history of livestock disease control in the state. The focus of infection was centered in the northeastern part of the state adjacent to infected areas in South Dakota, principally in Boyd, Cedar, Holt and Knox Counties. From this area the disease spread rapidly to adjoining counties until at least 37 counties were involved. More than 500 premises were classified as infected and large numbers of livestock succumbed to the malady. As a result of this widespread outbreak, an anthrax vaccination law was passed, giving livestock sanitary officials authority to vaccinate animals on infected premises. Since 1937 there has been a steady decline in outbreaks in this state. The Livestock Sanitary Committee of Sioux City, Iowa, published a series of anthrax maps, covering the period from 1937 to 1943, showing the number of herds of cattle by counties quarantined for anthrax in the so-called northwest anthrax areas in South Dakota, Nebraska, Iowa and Minnesota. A summary of the tabulations contained in these maps shows the number of herds quarantined in each of the four states as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>South Dakota</th>
<th>Nebraska</th>
<th>Iowa</th>
<th>Minnesota</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1937</td>
<td>1079</td>
<td>462</td>
<td>28</td>
<td>23</td>
<td>1592</td>
</tr>
<tr>
<td>1938</td>
<td>110</td>
<td>20</td>
<td>9</td>
<td>13</td>
<td>152</td>
</tr>
<tr>
<td>1939</td>
<td>107</td>
<td>25</td>
<td>1</td>
<td>0</td>
<td>133</td>
</tr>
<tr>
<td>1940</td>
<td>138</td>
<td>27</td>
<td>3</td>
<td>3</td>
<td>161</td>
</tr>
<tr>
<td>1941</td>
<td>132</td>
<td>17</td>
<td>2</td>
<td>6</td>
<td>177</td>
</tr>
<tr>
<td>1942</td>
<td>61</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>77</td>
</tr>
<tr>
<td>1943</td>
<td>38</td>
<td>5</td>
<td>11</td>
<td>2</td>
<td>56</td>
</tr>
</tbody>
</table>

The data indicate a marked reduction in outbreaks in this area since 1937.

Louisiana.—According to the report of the State Livestock Sanitary Board for 1940-1942, anthrax of a virulent type occurred for the first time since 1924 over an extensive area of the state. Outbreaks occurred in 27 widely scattered parishes extending from the northern to the southern part of the state. During 1943, also, outbreaks occurred in three parishes. A widespread virulent outbreak occurred in this state in 1924 involving about 40 parishes and resulting in the loss of great numbers of livestock.

Mississippi.—According to the biennial report of the Mississippi State Livestock Sanitary Board, July 1, 1941, to June 30, 1943, the state experienced an epidemic of anthrax in Wilkinson and Adams counties. Approximately 10 square miles in western Wilkinson County were placed under quarantine and hundreds
of head of livestock died in this area. Outbreaks were recorded in the reports of the Livestock Sanitary Board for 1937-1939 and for 1939-1941, but the extent and location of the outbreaks were not given. Outbreaks in this state were also reported in 1915, 1916, 1917, 1924, 1926 and 1927. In 1928 the disease was reported from at least 21 counties and in 1927 from at least nine counties.

Texas.—According to the annual reports of the Texas Livestock Sanitary Commission, three major outbreaks of anthrax occurred in 1935. Outbreaks also were reported in 1934, 1936 and 1937. In the 1937 report the statement was made that the disease is gradually spreading over the state.

An extensive outbreak occurred in 1941, involving a number of counties in the anthrax coastal area and in other sections of the state. This was the first year since 1930 and 1931 that widespread outbreaks have occurred.


California.—The Department of Agriculture reports of California for 1937 records widespread anthrax outbreaks during September and October of 1937 in the San Joaquin and Sacramento valleys while the 1942 report records 169 outbreaks in the same areas (127 in cattle, 23 in swine, 14 in horses, and five in sheep). The badly infected anthrax areas in California are located chiefly in the San Joaquin and Sacramento valleys, where minor or major outbreaks occur from year to year. According to the 1938 report other small anthrax areas exist in many localities, some of which are in coastal sections.

Sharp Outbreaks in Other Areas

In addition to the widespread outbreaks enumerated in the foregoing, outbreaks of a less severe nature have occurred in recent years in Arkansas, Alabama, New Mexico and Nevada.

Arkansas.—A rather serious outbreak was reported from this state in the summer of 1944 and involved at least six counties. Small outbreaks have also occurred in different parts of the state from time to time during recent years.

Alabama.—According to the Annual Report of the State Veterinarian for 1940, Alabama experienced the most extended outbreak of anthrax that has ever occurred in that state. Outbreaks occurred on 27 different premises in Hale and Perry counties, resulting in a loss of 187 cattle, 38 horses and 13 sheep. Smaller outbreaks also occurred in 1938, 1941, 1942 and 1943. During the 1943 outbreak, in Mobile County, 12 animals and two men succumbed.

New Mexico.—A serious outbreak occurred in August, 1939, in Colfax County. The outbreak spread over a considerable area, involving 19 herds and resulting in the loss of 262 cattle. A second outbreak of smaller proportions occurred in July, 1943, in Mora County, involving three herds and the loss of at least 45 cattle. During the outbreak in Colfax County, one ranch owner contracted the disease and died.

Nevada.—Outbreaks of anthrax during the summer of 1937 are recorded in the Biennial Report of the State Department of Agriculture for 1936-1938. The epidemic developed in grazing lands of Carson Sink section, an area of historical virulent infection in Churchill County. In the 1938-1940 biennial report, a severe epidemic of anthrax is recorded as occurring in Lyon County in the summer of 1939. The disease appeared on 25 ranches and resulted in heavy losses of livestock in Mason Valley and Smith Valley, long regarded as anthrax areas. A small outbreak also occurred in an anthrax district in Pershing County during the summer of 1943.

Sporadic Outbreaks in Recent Years

The states reporting the largest number of small, sporadic outbreaks in recent years are Colorado, Iowa, Maryland, Minnesota, New York, North Carolina, North Dakota and Virginia.

Recognized Areas of Infection

Certain well-defined areas in the United States, such as southeastern South Dakota, northeastern Nebraska, a belt along the Texas gulf coast, the Delta region of the lower Mississippi, including parts of Arkansas, Mississippi and Louisiana, and areas in the San Joaquin Valley and Sacramento Valley of California, have long been recognized as anthrax districts where widespread outbreaks have occurred from time to time during the anthrax season.

In addition to these districts a number of small areas, which are regarded as infected territory, exist in various parts of the United States.

Such areas, according to state department of agriculture reports from 1933 to 1944, are reported to exist in the following states:

1. Vermont: Areas in Franklin, Chittenden and Windsor Counties.
2. New Jersey: Areas in Salem County, where annual vaccination is carried out at state expense.
3. Delaware: Areas in New Castle, Sussex and Kent Counties, especially along the coast.
where annual vaccination is carried out at state expense.

4. Wisconsin: Three small sections in Dane, Sheboygan and Taylor Counties are known to be infected. In the latter county, outbreaks occurred for the first time about 50 years ago. On one farm in Dane County, outbreaks have occurred from time to time for 25 years.

5. Utah: One particular district exists, in the vicinity of Provo, Springville and Spanish Fork in Utah County, where seasonal outbreaks of the disease occur.

6. Nevada: Carson Sink section in Churchill County, Mason Valley in Lyon County and an area in Pershing County are regarded as anthrax areas.

7. Oregon: In Klamath Meadows and other areas in Klamath County, outbreaks have occurred from time to time. Derflinger reported severe outbreaks of anthrax in this area in 1928-1929 and 1930 involving cattle, sheep, horses, swine and man.

The well-defined anthrax districts and other areas in the United States from which outbreaks have been reported during the period from 1915 to 1944 are shown by counties on the accompanying map.

Occurrence of Anthrax in Livestock

Although anthrax in livestock in the United States is confined principally to cattle, outbreaks in horses, mules, sheep and swine are also encountered in about the order mentioned, especially in areas where large numbers of these animals are maintained. Outbreaks in goats and deer have been reported from Texas.

During outbreaks, cases in farm dogs and cats are occasionally observed, due to eating infected meat.

Anthrax in swine is usually the result of feeding on anthrax carcasses or other infected material. Swine are very resistant to the disease and although a number of animals in an infected herd may die with acute septicaemia anthrax, a considerable percentage will develop the disease in a chronic form or make a gradual recovery. However, months later, when some of these animals are slaughtered, evidence of anthrax infection may be found in the cervical lymph glands on post-mortem examination. During 1930, 314 such cases in swine suspected of being affected with anthrax and originating in the northwest anthrax area were detected on post-mortem examination in abattoirs under federal inspection in Sioux Falls, South Dakota, Sioux City, Iowa and Omaha, Nebraska.

Although outbreaks of anthrax in sheep have been reported from California, Oregon and other states, widespread outbreaks in sheep seldom occur in the United States. The Denver branch laboratory of the Pathological Division in the heart of the sheep-raising country has diagnosed only a few cases in sheep in the past three decades, although approximately 100 cases have been diagnosed in cattle.

Anthrax Outbreaks in Animals in Captivity

In recent years a number of outbreaks of anthrax in minkeries have been reported from different sections of the United States. Pinkerton reported an outbreak of anthrax in minks in two ranches near St. Louis, Missouri, in 1939, with infection of a ranch owner. In both outbreaks, infected horse meat was suspected as the source of infection.

Howerth and Seghetti reported recovering anthrax organisms from four dead mink in an outbreak in farm raised mink in Oregon in 1939. The source of the infection was undetermined. Stiles and Davis reported an outbreak in 1939 in the region of Denver, Colorado, on three ranches, which resulted in the death of 16 animals. The source of the infection was not determined definitely, but meat from cows or horses known to be sick at the time of slaughter was suspected.

The New York State Department of Health reported an outbreak of anthrax in mink on an upstate farm in September, 1941. Diagnosis was confirmed by the New York State Veterinary College, Cornell University. The outbreak resulted in the loss of 163 of a total of 516 mink. One fatal case developed in a man, who had skinned a number of the animals. The source of the infection in the mink was not determined, but infected horse meat was suspected of being the cause of the outbreak.

An outbreak of anthrax in animals at the Herman Park Zoological Gardens, Houston, Texas, was reported in October, 1941.

During this outbreak three mountain lions, three honey bears, one each of the following: badger, leopard, tiger, fox, jaguar, civet cat, bob cat, owl and longhorn steer were reported to have died from anthrax. Two human cases, also, were reported—one in a keeper and one in a small boy.

The source of this outbreak was traced to an infected horse, the meat of which was fed to the zoo animals about a week prior to the epidemic.

Correlation between Anthrax in Livestock and Agricultural Anthrax in Man

Although anthrax is considered to be primarily a disease of animals, it is transmissible to man either by direct contact with infected animals or indirect contact with infected animal material or objects contaminated with the organism.
Anthrax in man is, therefore, classified either as an occupational or non-occupational disease, depending upon the source of infection. Occupational anthrax is referred to as either of agricultural or industrial origin. Agricultural anthrax is acquired by close contact with infected animals or their carcasses, usually by handling, skinning or making post-mortem examination; while industrial anthrax is acquired by indirect contact, as in the manipulation of infected animal material, such as hides, wool and hair. Nonoccupational anthrax is acquired from the use of infected shaving brushes, wearing apparel and other indirect sources. It is not encountered as frequently as occupational anthrax.

In reviewing the reports, records and literature covering anthrax outbreaks in livestock for the past three decades, the writer was impressed with the frequency with which anthrax in persons is mentioned in connection with outbreaks. Although most of these cases of human anthrax occurred among farmers, ranchers and livestock handlers, due principally to handling, skinning or performing post-mortem examinations on infected animals, a number of cases show that veterinarians, also, are victims. Among these were three fatal cases, one a state veterinarian, the other two Bureau veterinarians who contracted the infection while on official duty.

According to Smyth there was a steady increase in agricultural anthrax in the 20-year period from 1919 to 1938. The definite trend in this direction is shown by a progressive increase in the percentage of agricultural cases to the total number of human cases reported during the four five-year periods from 1919 to 1938, namely, 13, 14, 26 and 34%, respectively. During the five-year period from 1934 to 1938, 26 states reported cases of agricultural anthrax in man, while nine additional states reported cases in former years. The rate of fatality has fluctuated, always being higher for agricultural anthrax than for industrial anthrax.

The states reporting the most human anthrax in the 20-year period aforementioned are Pennsylvania, New York, Massachusetts and New Jersey, mostly industrial; and Texas, California, Louisiana and Mississippi, mostly agricultural. Smyth's statistical reports also show that South Dakota, which had never reported anthrax in man prior to 1928, recorded 25 cases in the 10-year period from 1929 to 1938.

Smyth in a personal communication indicates that data on incidence of human anthrax for the five-year period from 1938 to 1943, soon to be published, will show that Texas, California and Louisiana are still among the states reporting the greatest numbers of human cases of agricultural origin.

This data on the incidence of human anthrax indicates that, with the exception of Nebraska, the states where virulent widespread outbreaks in animals have occurred from time to time and where the infection has existed for long periods also report the greatest number of human cases of agricultural origin.

Discussion

In the United States anthrax usually occurs in epizootic form in regions where the disease has existed for long periods. However, it may occur sporadically anywhere at any time and thus may appear where previously not identi-
tified or where it has been quiescent for a long period.

Since anthrax is essentially a soil infection, it is more or less confined to areas commonly designated as "anthrax districts." In such districts it constitutes a perennial problem, making its appearance during a definite period, known as the anthrax season, usually late summer and early fall when flies are very numerous.

Certain well-defined areas in the United States, such as southeastern South Dakota, northeastern Nebraska, a belt along the Texas Gulf coast, and the delta region of the lower Mississippi, including parts of Arkansas, Mississippi and Louisiana, are recognized anthrax districts where widespread outbreaks have occurred from time to time during the anthrax season.

In such areas the disease can be kept in check by preseasonal vaccination with appropriate immunizing agents. In recent years excellent results have been reported from some of the seriously infected areas following preseasonal vaccination with intradermic spore vaccine.

During some years losses from the disease in anthrax districts may be comparatively light, while in other years the disease assumes a very virulent form, appearing simultaneously at a number of places and spreading rapidly to new areas, causing heavy losses of livestock and assuming the proportions of a major outbreak. The cause of these fluctuations is not definitely known. While heavy rains, floods, periodic inundations, droughts and extreme heat, together with abundance of flies, no doubt play a part in the cause and rapid spread of these epizootics, it is generally believed that the factor most responsible is a relaxation in preventive measures, brought about by the false sense of security which stock owners gradually acquire during periods when few, if any, outbreaks occur.

Areas used for pasture in known anthrax districts should be under close surveillance for evidence of the disease. When animals die on or near premises where the disease has appeared previously, it is very important to know definitely whether the death was due to anthrax. Lack of such information may be responsible for heavy losses of livestock and, at times, the loss of human lives. Any previous occurrence of anthrax on the premises is sufficient reason for considering anthrax as a possible cause of any deaths among livestock that cannot be clearly attributed to other causes. In all questionable cases specimens should be submitted promptly to the nearest laboratory for bacteriological examination. Due precautions should be exercised in the collection, preparation and shipment of such specimens as pointed out in the article on the Laboratory Diagnosis of Anthrax that appeared in the April, 1943, issue of VETERINARY MEDICINE, pages 130-139.
Summary

The early history of anthrax in livestock in the United States is rather obscure. In Louisiana it has been traced back to the time of its settlement by the French. Widespread outbreaks are recorded as early as 1835 and later in 1851 and 1884. Outbreaks in Pennsylvania in the vicinity of Philadelphia are recorded as early as 1834. Outbreaks in Missisipi are reported to have occurred as early as 1836 and later in 1865, 1867 and 1868. In Texas outbreaks are recorded as early as 1860 and later in 1880 and 1887. Outbreaks in New York were recorded in 1881, 1884 and 1887; in Vermont and Massachusetts in 1887, and in California in 1888 and 1889. Infected areas still exist in most of these states.

The first survey made in 1916 on the nationwide incidence of anthrax in livestock indicated that the disease, at that time, existed in at least 157 counties of 21 states. In a second national survey to determine the prevalence of the disease in 1926, 22 states reported outbreaks, in 10 of which report of the existence of the disease had not been made in 1916.

During the 18-year period from 1915 to 1932, inclusive, outbreaks were reported from 41 states.

During the 12-year period from 1933 to 1944, inclusive, outbreaks were reported from 405 counties in 37 states. During this period two states reported outbreaks for the first time.

The over-all picture of the anthrax situation in livestock from 1915 to 1944 shows a gradual increase in territory involved. Outbreaks in livestock during that period were reported from at least 43 states, involving a total of 438 counties. The five states that have failed to report outbreaks are Arizona, Indiana, Maine, Michigan and West Virginia.

During the past decade one or more widespread outbreaks of virulent nature occurred in South Dakota, Nebraska, Mississipi, Louisiana, Texas and California, while sharp outbreaks of a less severe nature occurred in Arkansas, Alabama, New Mexico and Nevada. Numerous sporadic outbreaks occurred in other states. Since 1937 there has been a steady decline in outbreaks in the northwest anthrax area.

Recognized areas of infection of large dimensions exist in South Dakota, Nebraska, Arkansas, Mississipi, Louisiana, Texas and California, while small areas exist in Vermont, New Jersey, Delaware, Wisconsin, Utah, Nevada and Oregon.

During the period from 1939 to 1941 at least four outbreaks of anthrax in minkeries and a severe outbreak in a Zoological Park were reported from widely separated areas.

Most of the cases of agricultural anthrax in man are reported from the seriously infected areas where severe outbreaks occur in livestock.

Acknowledgment

The author wishes to acknowledge with gratitude the splendid cooperation of state livestock sanitary officials in furnishing the Bureau with data on anthrax outbreaks in recent years. The writer is also indebted to Herbert Rogers, Pathological Division, for valuable assistance rendered in plotting the anthrax map.

References

Reminiscences VIII

DURING the first two years in Cuba I was Vice-Director of the Experiment Station, however, in 1906, just before the "August Revolution," the Director resigned and I was appointed Acting Director and had charge of the Station during the revolution and until they could get a director who was a sugar expert, for sugar is the great source of wealth to Cuba, which some years produces as much as four million tons.

On the wall at our Station there was a marble tablet stating that, in the first inter-venture under Gen. Leonard Wood, he had established a trade school for orphan boys in this building. There was also a list of several American army officers who served under him, the first was Major E. St. John Grebel. I had pictured him as a dandified sort of fellow. Soon after the army landed a big six foot, hard-boiled man strode into my office and announced that he was Major Grebel and the governor had sent him out to inspect the Station. It appeared that the orphan trade school had been one of his "pets," but under Cuban mismanagement had failed entirely. His ice plant, steam plant, and practically everything movable had disappeared before we came. To say the Major was "sore" was putting it mildly. He was critical and domineering. He stated he was an agricultural authority—but he knew very little about it. We fought from "start to finish" and after he had gone I felt pretty glum but, to my surprise, he made a favorable report to the governor and was of much help to me afterwards.

The Station treasurer was embezzling station funds I felt sure and so reported my suspicions to the higher authorities. A government inspector came out and we were in the office. The treasurer said he had to get a drink. He came back in a few moments with a big revolver in his belt, threw his hat on the floor, and said he was going to shoot himself. Grappling with him, tipping over tables and chairs, after a short struggle, I got him down. In the meantime employees came running in, pulled me away and backed me across the room. The treasurer got up and pointed the revolver at me. It looked as large as a 3-inch field gun. He pulled the trigger—click—the gun was empty. This was the second, and I hope, my last "gun" experience.

Just about this time I was surprised to receive a visit from the Uruguayan Minister to Cuba who offered me the position as Vice-Director of the National Veterinary College at Montevideo, Uruguay. The salary was satisfactory and, as the spirit of adventure was strong in the whole family, I was disposed to accept the offer when I found that Dr. D. E. Salmon had been offered and accepted the position of Director. Dr. Salmon had just resigned as Chief of the U.S.B.A.I. after many years of efficient service. I had known Dr. Salmon slightly for many years and he appeared to me distant and rather aloof so it seemed that the connection would not be congenial and since some army friends in Havana urged me to stay in Cuba, I declined the offer.

There was in Havana a small private veterinary college and an effort was made to get a veterinary college established in connection with the University of Havana. A petition was presented to Provisional Governor Magoon and I was pleased to give the project my assistance with the result that the Governor approved the project. This was the beginning of the College of Veterinary Medicine at the University of Havana.

The Governor appointed me a member of the tribunal to examine the candidates for the different chairs in the newly established Veterinary College, that were to be filled by competitive examination. As only one candidate for each position appeared, competition was not keen. The candidate selected his subject, ascended a winding stair to a pulpit, looked at the clock and delivered an oration of, as I recall, thirty minutes' duration—all candidates passed.

About 1905 I visited Jamaica to see what the English had done to develop a livestock industry. I called on the official veterinarian in Kingston who had a dairy in the city. The cows were practically all imported from the Eastern States. I asked him if he lost many cattle where they raised bulls used as oxen to haul bananas to the dock when fruit boats came in to load. All the help handling, these big oxen had was of much help to me afterwards.

At Spanishtown near Kingston I saw my first Brahma cattle. The United Fruit Co. had a herd where they raised bulls used as oxen to haul bananas to the dock when fruit boats came in to load. All the help handling these cattle were East Indians. The manager said the Brahma cattle were too nervous for the natives to handle. He also said the Brahma
oxen would trot like mules day and night with heavy carts holding two to three tons of bananas. The manager had the cows brought to the corral. The pure Brahmas with their long pendant ears and sleepy eyes look very mild but this look is deceptive. When the cows saw me, a stranger, they stopped, stamped and snorted like wild animals. The English had some very good Hereford cattle but Jamaica was the "tickish" region I ever visited.

Someone has called the American tropics a "land of the wailing donkey and all abound-ing flea" and he should have included bed bugs. In the small towns hotel accommodations were very primitive. In towns, houses are built solidly along the sidewalk. One would ride his horse in the front door, through a living room, dining room and kitchen to a "patio" in the rear. On one side were a few horse stalls and on the opposite side a few sleeping rooms, crudely furnished with an iron bed with rickety springs, a sort of pad, a sheet and a mosquito net over all. I recall an instance when I got ready to get into the bed my pajamas were literally black with fleas. You may not know, but a flea is an uneasy bedfellow. I was in a quandary, but I finally got on a chair about four feet from the bed and by a considerable effort brushed all the fleas off on the floor and then made a flying leap to the bed.

In another instance the bed bugs were so numerous and fierce I could not sleep. I had a good supply of formaldehyde with me to preserve specimens, so I saturated a ring around me on the bed and got a little rest. I learned how to sleep, or try to, in a hammock. It is not very comfortable but the best way is to spread the hammock wide and lie crosswise.

There was an outbreak of yellow fever in Havana and when another American, a salesman for a Chicago Packing Co., got off a train in Eastern Cuba a policeman spotted us as non-immunes and took us to the local sanitary office. The salesman had been on a big spree and was running some temperature so they put him in quarantine and paroled me to the hotel with orders to report for observation the next morning. The salesman begged me with tears in his eyes not to desert him. His temperature was normal the next morning and they let us go.

The Cubans are a delightful people to meet, friendly, courteous and hospitable. If you are a guest about to leave, they will tell you that their house is yours and you respond by offering your house. On one occasion José Palma was with me and as we left a small country home, the host gave us his house and José responded "in Havana at the palace you have a house and friend." The consternation of the country man to think he had entertained the president's son was amusing. Riding up to a country home one was invited in, the horse taken, maybe a pig would be chased out of the house and then the coffee mill would be started and black drip coffee made—very sweet that would put a "permanent" in your hair.

One time in Central America when riding up a mountain there was a fork in the trail. A small shack was near, and I rode up to ask the way. A man was eating his midday meal that consisted of a half dozen boiled sweet potatoes (boniatos). With customary Spanish hospitality he held up the dish and said "Won't you join me? It is all I have but my heart is with it." To his surprise I said I would as I had some food in my saddle bag, a canned plum pudding, a can of sardines and some hard bread. He may have seen some hard
bread before. The extravagant praise he showered on this food will be long remembered and I am sure he had never eaten such a meal before.

Some country people for whom I had done some favors invited us to a roast pig dinner one Sunday some 10 miles in the country. The pig, roasted whole, was delicious and there was plenty to go with it including red wine. While we were eating under the trees a pair of rural guards who police the country stopped and, after eating, went on. One of the farmers asked me if we did not have lots of rural guards in the United States. I told him we didn't have any. He said you raise lots of horses and cattle there why don't thieves steal them. I told him that if a farmer had a horse stolen, he got his gun and went with a police officer and got the thief. Then the farmer said, "If I saw a man stealing my neighbor's horse and an officer asked me about it I would tell him I didn't see anyone, for maybe the officer sent the man to steal the horse. We live in thatched houses"—implying some accomplice might set the house on fire.

During the intervention a company of U. S. Infantry was stationed at a small town near us. When they marched out to return to the U. S. the people lined the street and many wept. I asked a Cuban friend why, and he said, "We are country people and when we get up in the morning we want to find our horses and cattle all right. When the Americans are here our stock is safe."

Waiting in the hotel in a small Cuban town, a negro policeman at the door heard a noise down the street and he said something about a small American and I followed him. In the street three or four boys about 12 years old were having a fight. The policeman grabbed two and turned a torrent of Spanish on them. I asked one of the victims if he spoke English and he said, "Sure, I'm an American." I asked him about the trouble and he said the Cuban boys had a dog tied to a telephone pole and were going to stone it to death. "No American would stand for that, would he? I told those boys the first one who threw a rock at that dog would have a fight on his hands." I think he was quite a fighter according to the policeman.

I had an opportunity of meeting many Cubans who had taken an active part in shaping the destiny of Cuba. Gen. Maximo Gomez, the leader in two wars for the liberation of Cuba. "Dynamite Johnny" O'Brien who was master of a seagoing tug that carried arms and supplies to the Cuban revolutionists and who was then a harbor pilot. Dr. Carlos Findlay, Sr., who was the originator of the theory that mosquitoes were the cause of yellow fever, and many others.

In 1909 an anti-American political party came in power, our resignations were requested and the Cuban agriculture experiment station was taken over by political appointees. We had no regrets for here in this beautiful tropical island we had spent five of the most interesting years of our lives and we sailed back to our own land.

(To be continued)

Prevalence of Encephalomyelitis

The cases of encephalomyelitis reported to the Chief of the Bureau of Animal Industry January 1 to September 1, 1945, numbered 901

A three-year-old draft mare as she appeared the first day of infection with encephalomyelitis.

A four-year-old saddle mare on the third day of treatment for encephalomyelitis which indicates if the incidence follows the usual trend, a total for the year of 5000 cases. So far in 1945, 25 states have reported the occurrence of one or more cases of encephalomyelitis among its horses; 21 states report that no case have occurred and two states, Georgia and Maine, have made no report. Seven states report 50 or more cases—California 158, Missouri 49, Iowa 92, Nebraska 91, Kansas 70, Oklahoma 60 and Minnesota 56 cases.
Clinical Reports

Museum of Canine Pathology

An adult, male dog of mixed breeding was brought in by the police for examination. The dog had been found in convulsions on a nearby highway and was held for observation.

The symptoms were convulsions at frequent intervals, exhaustion, with ptyslism and apparent toxemia. The animal was depressed and unable to stand.

As no claim of ownership had been made, it was decided that the most humane procedure was to subject it to euthanasia. This was accomplished by injecting 10cc of chloroform into the atlanto-occipital articulation.

A post-mortem examination revealed extensive pathological changes. Upon opening the abdominal cavity, the cystic kidney shown in the accompanying illustration was noted. Its size as compared with the other kidney is also shown. The cystic kidney contained 13.5 ounces or 405cc of clear, straw-colored fluid with the odor of urine. The entire parenchyma of the kidney had atrophied so only remnants of it remained adherent to the capsule. The remnants were non-functional as far as could be determined by gross examination. The more normal kidney had apparently undergone some fibrosis which increased its size slightly.

Further examination revealed two spleens also shown in the photograph. Each spleen had adequate blood supply to be functional. The spleen which is oblong in shape had developed three hemorrhagic infarcts; the other spleen appeared to have been normal in shape but had become folded upon itself so that it was more oval in shape. At one point there appeared to be a hemorrhagic infarct in the process of development.

Examination of the respiratory system revealed no pathological changes. The heart was normal in appearance. The mouth, pharynx, esophagus and remainder of the digestive tract were normal in structure. There was a severe hemorrhagic gastroenteritis. Heavy hook-worm infestation was noted, also a few ascariads and tapeworms. The rectum and posterior part of the large intestine was filled with dry, hard fecal material. These lumps of feces, when crushed released a bright yellow powder which resembled powdered sulphur.

The diagnosis was cystic kidney, severe hemorrhagic gastroenteritis, constipation, taeniasis, severe ancylostomiasis, ascariasis, hemorrhagic infarcts of the spleen, and the presence of an accessory spleen.

George M. Chapman
Glasco, Kans.

Simple Method of Bleeding Swine

There is an increasing demand for testing swine for brucellosis. Some have discouraged this work because of difficulty in drawing blood samples. A method of bleeding swine, which possesses several advantages over conventional methods, consists of collecting blood from a dew-claw. Slightly less than one-half of the dew-claw is clipped off with a pair of sheep hoof trimmers or hand pruning shears. Blood drips from the cut surface enabling the practitioner to obtain a sufficient amount quickly. There is no danger of continued hemorrhage since a clot soon forms and bleeding ceases. The cut surface may be painted with any suitable antiseptic.

Since most brucellosis testing is in purebred herds, where the appearance of the animal is important, tail bleeding is strongly objected to by owners. Anyone who has tried bleeding from the ear, under field conditions, will testify that this method is unsatisfactory and annoying, especially in dark skinned hogs.

Bleeding from the anterior vena cava as advocated by Carle and Dewhirst seems to have considerable merit under certain conditions. However it is accompanied by the disadvantage that each hog must be snubbed individually to a post by a rope over the snout. Under average field conditions with a lack of agile help bleeding a herd of any size by this method entails considerable labor and is time consuming as well.

In bleeding from the dew-claw it is not necessary to snub the animal taut as the head does...
not need to be held stationary. In small herds crowding each hog in a corner with a panel is sufficient restraint. In large groups of hogs, where frequent testing is done, a narrow chute can be devised in which several hogs can be kept in position and bled without handling each one individually. Occasionally a hog will show a temporary sensitiveness in the foot from which blood is drawn but no bad results have been noted. The blood drawn is in good condition for laboratory use. After the first bleeding only a thin slice need be removed from the claw for subsequent bleedings or a different dewclaw may be used. The shortened dewclaw is not noticeable or objectionable. In fact many swine breeders commonly trim the dewclaws along with hoof trimming in fitting hogs for shows.

Belleville, Kans.

Treatment for Whipworms in the Dog

February 15, 1945, a nine-year-old male, liver and white pointer was presented for treatment with a history of having had a bloody diarrhea for two months.

The dog showed the following clinical symptoms: dehydration, emaciation, posterior pallor, bloody diarrhea and a marked anemia. On fecal examination, evidences of tapeworms (Dipylidium caninum), hookworms (Ancylostoma caninum), roundworms (Toxocara canis), coccidia (Isospora iminitis) and whipworms (Trichus vulpus) were found in abundance.

Nemural, one tablet per seven pounds body weight was administered for the taeniasis, and normal butyl chloride, 1cc per 10 pounds body weight was given to combat the hookworms and roundworms. The coccidiosis was treated by feeding buttermilk, one quart a day and maintaining strict sanitation for a period of 10 days. The patient's general condition showed some improvement for awhile but gradually returned to the condition previous to treatment.

Fecal examinations were run showing whipworm eggs still very much in evidence. Further treatment with normal butyl chloride and tetrachlorethylene, 1cc per 10 pounds body weight, was administered. These anthelmintics were given per os on an empty stomach. This treatment seemed to have little or no effect on the whipworms. The dog was finally treated with a dilute solution of potassium permanganate per rectum and in a week showed marked improvement and in two weeks was sent home a well dog.

This type of application is necessary due to the location of the adult whipworms in the cecum. Anthelmintics given orally fail to come in contact with the parasite. For this reason satisfactory treatment can best be achieved by the administration per rectum.

The method of passing the colon tube is as follows: The equipment necessary includes a three-fourths-inch glass tube, two to two and one-half feet long, with smooth ends, and a horse catheter. The glass tube is lubricated and passed per rectum two-thirds the length of the body of the dog, through this the horse catheter is passed. A dilute solution, 0.001 to 0.05%, KMnO4 in water at body temperature is administered by gravity flow. One-half to one gallon of this dilute solution is used.

The anatomical arrangement of the rectum, colon and cecum along with their mesenteric attachments make the passing of the colon tube by this method very simple. The rectum and colon have long mesenteric attachments and are freely movable. The glass tube straightens out the curves of the rectum and colon while the short mesenteric attachments of the ileo-colic juncture and cecum control the movability of this portion of the intestinal tract. This places the cecum in direct line so when the horse catheter is passed it enters directly into the cecum which can be felt by resistance encountered as the catheter reaches the blind end of the diverticulum. There are several anthelmintics that may be used with success, such as tetrachlorethylene and normal butyl chloride; however, the expense, irritability and toxicity of these and others have their disadvantages. By using a dilute solution of KMnO4 per rectum, excellent results have been accomplished. There have been no ill effects from toxicity or irritability.

Ordinary anthelmintics have little effect on whipworms when given orally due to the location of the worms in the cecum. Resection of the cecum is a very satisfactory method but it is difficult to convince the client of the need for this drastic treatment. Also, animals in a weakened condition cannot stand the operation. This leaves treatment by passing a colon tube and the use of potassium permanganate solution, not only a very satisfactory treatment, but one which is practical as well. The use of the permanganate solution was learned while employed under the tutelage of Dr. B. F. Pfister of Kansas City, Mo.

References


R. C. Wright

Kansas City, Mo.
Penicillin Therapy in Actinomycosis

Actinomycosis of the bone is not generally amenable to iodine therapy, and supposed cases that respond, are apt to be found on closer examination to have been actinomycosis or actinobacillosis of the muscles. This is particularly the case where the mandibular area is involved. Due to the extensive inflammation it may be difficult to determine whether or not the swelling is movable in this location. Cases of salivary cysts sometimes may also be diagnosed as "lumpy jaw." The following case deals with the use of penicillin in a case of actinomycosis of the mandible.

April 22, 1945, I was called to see a purebred, registered Aberdeen Angus cow about five years of age and weighing about 950 pounds. The right side of the jaw was badly swollen and there were five places that had "headed up"; two of them were discharging. The animal had been treated twice the year before, with only temporary improvement, but the owner wanted another effort made to cure her. I applied the method which generally gives me good results where only the soft parts are involved. This consists of about 3gm of sodium iodide in solution per 100 pounds body weight, given intravenously, lancing and draining softened areas, excising some of the fibrous tissue, packing with gauze soaked in formalin, sewing the opening and leaving an iodine preparation to be fed on grain. The two discharging areas extended deeply into the marrow of the ramus but the alveoli of the molar teeth were not involved. Due to the long-standing of the case it may be difficult to determine whether such an expensive treatment is warranted. Due to the extensive inflammation it may be difficult to determine whether or not the swelling is movable in this location. Cases of salivary cysts sometimes may also be diagnosed as "lumpy jaw." The following case deals with the use of penicillin in a case of actinomycosis of the mandible.

The April issue of VETERINARY MEDICINE* stated that it was found that the maintenance of the effective blood level of penicillin was doubled in length when an ice bag was kept over the site of injection one hour before and five hours after injecting the drug. It is logical to suppose that epinephrine would give a similar effect, but I decided to use ice. Accordingly the cow was put to sleep with chloral hydrate anesthesia and the ice was applied in burlap bags over the sites of injection. Due to consideration of time and anesthesia, the ice was applied for one hour before and only one and a half hours after injections. To maintain anesthesia more chloral hydrate was given after the injections were made. The penicillin was dissolved in sterile, pyrogen-free, distilled water and was distributed in the proportion of about 70% into the muscles around the affected area and the remainder intravenously.

Four days after treatment the owner reported the inflammation had noticeably receded and the cow was eating better. When told further treatment would be needed he was reluctant to consent, because I could give no definite word about when and if definite recovery would occur. As was to be expected, without further treatment the case relapsed. Ten days later the animal was in as bad condition as ever and the owner decided to market her.

Of course in the light of present knowledge, the case should have been handled quite differently. However the fact that some response to penicillin was noticed by the owner who had observed the cow every day is sufficient to warrant further trial in such cases. More than this should not be inferred from this single, incomplete test.

It is to be hoped that other practitioners will report their experience with penicillin in actinomycosis of the bone and that the current penicillin research in the veterinary field will include experiments on its use in this disease.

Grayville, Ill.

NATHAN POLLACK

Nymphomania in a Mare

April 5, 1945, a bay mare five years of age and weighing 1500 pounds was presented by the owner for examination and advice.

History.—This mare had been showing symptoms of continual heat for a period of one year. She was irritable and extremely nervous. Six weeks previously she had been examined by a veterinarian who made a diagnosis of cystic ovaries and advised oophorectomy. The animal was useless in her present condition and this suggestion was approved.

Treatment.—The mare was restrained in the large animal stocks and given ½ ounce of chloral hydrate in one gallon of water through a stomach tube. A 16-gauge, two-inch needle was inserted between the first and second coccygeal vertebrae into the epidural space,
and 15cc of a 1% procaine solution was injected to anesthetize the vaginal wall.

The tail was wrapped to prevent contamination and the external genitalia carefully cleansed. Observing strict asepsis, a sharp scalpel was carried into the vagina and an incision made through the vaginal wall and the peritoneum approximately two inches above the cervix. The hand was thrust through the incision and the ovary grasped. A mare spaying eraser was introduced alongside the arm and the ovary removed. The opposite ovary was removed in the same way.

The mare was left standing undisturbed in the stocks for 24 hours to prevent excessive post-operative hemorrhage. She was then placed in a small stall and tied very short to prevent her from lying down. Other than a slight rise in temperature on the 2nd day recovery was uneventful. The owner reported, three weeks later, that the mare was quieter and much easier to handle.

The ovaries proved unusually cystic. The right ovary contained four cysts, one of which was exceptionally large. The organ measured 8.4 by 6.4 cm. The left ovary contained three relatively large cysts and measured 7 by 4.5 cm.

J. E. MOSIER
Hoxie, Kans.

Urinary Calculus in a Bitch

A black, female cocker spaniel, weighing about 40 pounds and considerably overweight, was brought to our clinic with a history of polyuria. The dog had been spayed at the age of six months. According to the owner she had been fed ordinary table scraps, sometimes supplemented by various commercial dog foods.

The temperature of the animal was 102.4° F. and she seemed to be fairly normal in all respects. However, upon palpating the abdominal region a hard mass of the size of a golf ball could be felt in the bladder. A tentative diagnosis of urinary calculus was made, and a fluoroscopic examination was made which showed a dark, almost circular, mass in the bladder. A catheter was inserted, but urine was not forthcoming. The owner was advised that surgical interference was the only satisfactory method of removing the calculus and the operation was set for the following day.

The dog was restrained in dorsal recumbency on the operating table. An area anterior to the pubis and reaching to the fold of the flank was shaved for a distance of about six inches forward toward the umbilicus. The area was scrubbed with alcoholic sublimate, painted with tincture of iodine and covered with an alcohol sublimate pack. Ether anesthesia was employed.

A shroud was used to cover the operative area. An incision two to three inches in length was made on the linea alba through skin, fascia muscle and peritoneum. The bladder was withdrawn to the outside and an incision made through the walls where the blood vessels showed the fewest anastomoses. Cae was taken to prevent the escape of urine into the peritoneal cavity. The calculus was removed and the incision sutured with a double row of Lembert sutures, thus bringing the serous coats into contact. The incision through the skin, muscles and peritoneum was closed with three rows of interrupted sutures. Surgical sulfanilamide was placed over the abdominal incision and a gauze pack applied and held in place with a muslin bandage.

The animal was then placed in a clean cage to recover from the anesthesia and 30 minutes later was given, orally, 10 grains of methenamine (urotropin). The next day the temperature was 102.8° F. The methenamine (10gr) was repeated.

On the third day the methenamine was repeated and the animal exercised. On the fourth day the dosage of methenamine was reduced to five grains. During these days (first to fourth following the operation), water was kept before the animal and milk made up a large portion of the diet.

The stitches were removed on the fifth day and the dog was taken home. No recurrence of the polyuria has been reported.

This operation is comparatively simple and its benefit is apparent, even to the most unobservant owners. The calculus removed in this instance was of fairly large size—weighing 85 grams and measuring 5.2 by 4.5 centimeters.

J. F. MORROW
Springfield, Ill.

An X-ray photo showing the site of the calculus.
Sodium Bisulfate Poisoning in a Dog

An excited call was received at ten o'clock one morning from a woman who stated that she had just seen her dog eating sani-flush, which had been spilled on the bathroom floor. She was advised to place a teaspoonful of table salt on the back of the dog's tongue, to produce vomiting, and bring the animal to the hospital as soon as possible. The dog entered the hospital 15 minutes later. The owner reported it had vomited some on the way to the hospital. It was a black male cocker about 11 months of age and appeared to have been in excellent physical condition before eating the sani-flush.

A quick examination revealed the dog was not in severe pain and was making weak efforts to vomit. It was frightened and nervous but not hard to handle. The diagnosis, based upon the history, was sodium bisulfate poisoning.

Treatment was started immediately by passing a stomach tube and giving 250cc of water to act as a diluent for the poison. One-eighth grain of apomorphine was placed within the conjunctival sac to produce emesis. After waiting a few minutes for vomiting to occur it was decided that the apomorphine was not going to produce emesis and a gastrointestinal lavage was given. The dog vomited freely and about two teaspoonfuls of the sani-flush was noticed in the vomitus. After the intestines and stomach were thoroughly emptied the dog was placed in a kennel under close observation.

Two hours later a small amount of material which contained blood was vomited. A subcutaneous injection of 1/100 grain of atropine sulfate was administered to aid in the control of severe gastric spasms, which were expected. A stomach tube was again passed and a mixture containing vegetable mucin and small amounts of gum karoya, brewers yeast, magnesium carbonate and bone meal was given in warm water. One ounce of the mixture was mixed with five ounces of warm water and given before becoming too gummy. A dose syringe was used to force the thick solution into the stomach tube.

No more vomiting occurred but the dog refused its food that evening. He was closely examined and was found apparently normal in every way except for being a little sensitive over the abdomen. He rested normally through the night and was given one-half the usual hospital feed in the morning, which he ate without hesitation. At noon he was given five grains of bismuth subgallate. The dog appeared normal throughout the day and was given five grains of bismuth subgallate in the evening; after which he ate a full meal. By noon of the third day the patient appeared to have recovered completely and was discharged from the hospital. Three days later the owner stated the dog was all right and appeared to have suffered little from his experience.

Conclusion.—The action of sodium bisulfate in the sani-flush would no doubt cause severe damage if it were in contact with the gastric mucosa very long. Sodium bisulfate is not so strong an alkali as lye. Its chemical formula is NaHSO₄ which ionizes to form sodium hydroxide and sulfuric acid. When sani-flush is mixed with water it gives a strong acid reaction due to the liberation of loose hydrogen ions. The pH of the dog's stomach, which is definitely acid, is due mostly to the hydrochloric acid secreted by the fundic glands of the mucosa. This hydrochloric acid may have reacted with the sodium bisulfate to form sodium chloride and sulfuric acid which would have given the same result. The prominent first aid treatment for poisoning—fill, drain, and refill—worked well in this case, but an alkaline such as bicarbonate of soda would...
have been indicated to neutralize the acid. The mucous mixture merely absorbed those secretions and poisonous materials that were left in the stomach. The action of the atropine sulfate appeared to control gastric spasms. The bismuth subgallate was given to coat the bowel and stomach to prevent further irritation.

Iowa City, Iowa

**Bull Salvaged by Artificial Insemination**

Dairy bulls which are proved transmitters of high production are held in great esteem. Every effort is made to keep such bulls in service, yet many of them fail annually, due to causes other than sterility.1

A case was observed in which a valuable proved sire was about to be sent to slaughter because of an injury to the penis which prevented him from successfully serving a cow. The bull was nine years old, healthy and in vigorous condition, but due to a weakness of the anterior third of the penis, he could not maintain a sufficient erection to complete service. His difficulty dated back 18 months to a time when he had been injured in serving a cow in a breeding chute, under a shed entirely too low for a bull of his bulk. Various devices designed to support the penis and prepuce had been tried by the owner unsuccessfully. The bull was unable even to serve an artificial vagina.

Rectal massage of the ampullae of the ductus deferens, similar to the method of Miller and Evans,2 was finally attempted, and such copious amounts of highly motile spermatazoa were obtained that it seemed advisable to attempt the use of the bull in artificial insemination.

In light of the experience gained in this case, the purely physical "milking" or stripping of the ampullae of the ductus deferens leaves something to be desired. A physiological response, the exact nature of which has not been determined, seems to be operating. Gentle stroking of the ampullae in a slow, rhythmical manner until the desired results were obtained appeared to give a semen sample far superior to any obtained by a rougher method in which an attempt was made to force the content of the ampullae down the urethra.

This animal was used subsequently for two seasons in a herd with 100 inseminations recorded, and 58 cows either delivered or pronounced safe in calf. This gives an average of slightly over 1.7 inseminations per conception. However, two of the cows in the herd required five and 12 services, respectively, and neither conceived. They were probably sterile. Eliminating these services, the bull's reproductive efficiency would appear even more favorable (1.4 services per conception). At the end of this period he was still clinically negative and no pathological condition of the internal genitalia could be determined.

**His semen was subjected to a complete examination several times and stored on several occasions.** An average concentration of 300,000 spermatozoa per cubic millimeter was found. The semen, diluted with Phillips egg yolk phosphate buffer solution,3 and stored at 45° F, maintained good motility for an average of four days. Morphologically, less than 5% of abnormal spermatozoa were found.

The case seems worthy of note. Since no prepuberal trauma or evidence of penile tuberculosis could be found4 and since the condition could be attributed to a definite injury occurring well after sexual maturity, it is quite unlikely that any hereditary factor was involved. His calves were extremely vigorous at birth and developed as well as any calves kept under intensive dairy conditions. It seems that this case presents an exception to the statements of Williams5 that bulls unable to complete service should be discarded.

In cases of this sort, under average practice conditions, objections might be raised but considering the value of the calves produced, it would appear to be good breeding practice to salvage bulls of this calibre by this method. Semen storage might be resorted to, eliminating collection for each cow to be bred. This of course would be determined by the size of the herd. In most cases, probably only the most valuable of bulls would be able to justify the expense involved.

The knowledge of anatomy and physiology involved places this method strictly in the veterinarian's realm, and it appears that practitioners who have a considerable number of purebred herds in their territories should consider this method of salvaging valuable bulls in the event that similarly injured animals are brought to them for treatment or advice.


5 Williams, W. L., Diseases of the Genital Organs of Domestic Animals, Ch. 176-177. 1949. Published by author, Ithaca, N. Y.

Waverly, Ill.

ROBERT M. JARRETT
Abstracts

One-Injection Treatment With Penicillin

The greatest drawback to the use of penicillin in veterinary medicine, after the reduction in price, was the frequency of administration that was required by intravenous injection. The discovery that the action of the drug may be greatly prolonged by mixing the calcium salt in peanut oil and beeswax and injecting it intramuscularly renders it highly practical for veterinary use in indicated conditions.

A report of the use of calcium penicillin in beeswax-peanut oil in the treatment of 75 cases of gonorrhea illustrates the effectiveness of this method. Among the 75 patients who were given a single injection of 150,000 units there were no failures. A high blood level of penicillin was maintained for 7½ to 10 hours and 83% of the patients showed improvement in 12 hours, 95% in 24 hours and the remainder in three days.

The Fluorides as Anthelmintics for Swine

Tests of various fluorides, alone and in combination with phenothiazine, were conducted, by the Zoological Division® of the Bureau of Animal Industry to determine their anthelmintic efficiency against the principal internal parasites of swine.

One hundred fifty-one pigs, seven goats, five sheep, one bull, seven horses, two dogs and two chickens were used in these experiments. The conclusions from these investigations, which the authors regard as preliminary, were:

1. Aluminum silicofluoride, sodium aluminum fluoride, aluminum fluoride, barium fluoride, and sodium silicofluoride all were without value as anthelmintics for swine.

2. Sodium fluoride is highly effective against ascarids (average efficiency 97% but in most of the test animals it removed 100% of the Ascaris lumbricoides) but was less destructive to other helminths than some other agents (phenothiazine, oil of chenopodium, carbon tetrachloride).

3. A combination of sodium fluoride and phenothiazine (mixed with the feed) is highly unpalatable for swine and probably not more effective against intestinal helminths than is sodium fluoride alone.

The procedure combining the greatest convenience, highest efficiency and least disturbance to the pigs was to allow the animals one-half the regular ration for one day. Then on the following day 1% of sodium fluoride was added to the regular ration. Nearly all pigs consumed it readily. When any of the medicated feed remained uneaten it was not removed but the regular feed added to it the following day.

Although the animals were heavily parasitized and in poor condition, and were considered poor risks for anthelmintic treatment, they were not significantly harmed by the 1% mixture.

In 5% concentration in the feed sodium fluoride is highly toxic (usually fatal) to swine and other farm animals, including chickens. Because of its well known poisonous properties the authors recommend that only tinted sodium fluoride be procured for anthelmintic purposes, in order to minimize the chances of accidental poisoning.

Although the authors concluded that sodium fluoride is a promising medicament for removing the large roundworm from swine they state that much further investigation will be necessary before it can be endorsed as a safe and suitable anthelmintic.

Control of Distemper in Foxes

Although canine distemper has been recognized as a disastrous disease of foxes since the early days of the silver fox industry, it is still one of the principal causes of loss of animals on fox ranches. An uncontrolled outbreak may in a few months destroy 50% of the breeding stock and 80% of the pup crop.

In 1938 a successful vaccine (distemperoid) for the prevention of distemper in foxes was developed by the author on the Fromm Brothers fox ranch at Hamburg, Wisconsin. The vaccine consists of a distemper virus modified by 50 or more serial passages through ferrets. Although the virus is extremely patho-
genie for ferrets it rarely causes even slight disturbance when injected in other than very young fox pups. In these (fox pups three weeks to six weeks of age) it may be used safely if a small dose of distemper anti-serum is administered at the same time. A solid long-lasting immunity is produced rapidly, following vaccination. It is advised that breeding foxes be vaccinated about December 1st and pups when they are eight weeks of age, unless the danger of infection is imminent. All foxes on the ranch should be vaccinated to assure freedom from distemper.

**Red Water Disease**

Bacillary hemoglobinuria of cattle and sheep has been recognized in western Nevada for more than 60 years. 8 During half of that period it has occasioned severe losses in infected districts. The disease is widespread in the Western Hemisphere; occurring in California, Idaho, Nevada, Oregon, Montana, Louisiana, Utah, Texas, Mexico and Chile. Losses usually occur when the animals are on pasture in intermountain meadows, irrigated lands or overflowed areas. The highest incidence generally occurs from June to November.

Redwater disease is due to infection (in the liver) with the *Clostridium hemolyticum*.

The case mortality exceeds 90% and death losses in a herd may be 25%. The disease is characterized by a rapid destruction of the erythrocytes and death results from anoxia. Appetite, rumination, lactation and defecation cease suddenly in affected animals. Breathing is shallow and labored; the temperature 103 to 106° F.; the pulse weak; the urine port wine color, foamy and increased in amount. Dehydration is marked. The red cell count falls to 4,000,000 to 2,000,000 and even lower.

Although bacillary hemoglobinuria is easily recognized by the symptoms it has, on occasion, been confused with cystic hematuria of the Pacific Northwest, infectious pyelonephritis, cystitis and anthrax. The post-mortem lesions are characteristic and should resolve any doubt as to the diagnosis.

The course of the disease is 12 hours to three or four days, but usually about 36 hours from the first appearance of symptoms. The only treatment of any avail is an antiserum developed at the Nevada Agricultural Experiment Station. The curative effect of the serum is enhanced by appropriate tonic and supportive treatment.

In cooperation with the Cutter Laboratories a bacterin (bacterin-toxoid) has been developed which affords practically 100% protection against the disease for a year. Vaccination is often followed by a severe and persistent local reaction but this may be avoided by observing proper procedures.

This bulletin is a result of a study begun in 1914 and carried on continuously since that date.

**Keratoconjunctivitis in Cattle**

This discussion 87 should serve to clear up some confusion that has existed among veterinary practitioners during the past year or longer.

Clinical observation established with fair certainty many years ago that pink-eye or keratitis is an infection to which cattle in hot, dry, dusty pastures or feedlots are predisposed during periods of brilliant sunshine. And that the disease spreads rapidly through a herd, occasions great loss in condition, results in many cases of blindness and causes some deaths.

Research by various investigators has confirmed these conclusions and more than 20 years ago Jones and Little 88 demonstrated that the infection is due to a diplobacillus—*Haemophilus bovis*.

Recently several practitioners have reported spectacular recoveries following the administration of vitamin A in herds affected with a condition indistinguishable, clinically, from infectious keratitis—pink-eye.

In this discussion the authors recognize two forms of keratitis or keratoconjunctivitis in cattle and presumably in sheep and goats, one as a vitamin A deficiency, the other and more important, due to infection by the *H. bovis*. They think *H. ruminantium* would be a more appropriate name for the organism. Schmidt (1941, 1943) described the nutritional type of the disease due to vitamin A deficiency.

The infectious keratitis is readily communicable by contact but, apparently, is not spread naturally by insects as has been suspected. A strong immunity was developed by an attack of the disease.

On the Gulf Coast of Texas the authors found 90% of the cases to be unilateral at the beginning of the attack. This would appear to offer a means of partial differentiation from the nutritional type of the disease in which a majority of the cases are said to be bilateral.