

Animal Health: A Century of Progress

by Neal Black

Chapter 1--Organization

While it is generally accepted that the organization which became the United States Animal Health Association began with a meeting in September of 1897 in Ft. Worth, TX, there were at least two meetings of state livestock regulatory officials before that.

The first, according to a history of the association published in the proceedings of the 54th annual meeting, apparently was in late 1891 or 1892. The report of the board of live stock commissioners of Illinois for 1892 contained several resolutions on tuberculosis in cattle adopted by the Inter-State Meeting of Live Stock Boards and State Veterinarians.

Minutes are available in the National Agricultural Library in Beltsville, MD, of a National Live Stock Sanitary Convention in Washington, DC, June 19-21, 1894. Representatives from eight states and the Bureau of Animal Industry of USDA attended. A committee appointed to consider a permanent national organization recommended forming the National Live Stock Sanitary Association and a committee was named to draft a constitution and bylaws. Subjects discussed at this meeting included uniform state laws, glanders, TB and Texas fever quarantine. No record of any additional meetings of this group can be found.

These first, faltering attempts to form a national organization certainly laid the groundwork for the meeting Sept. 27 and 28, 1897--the first of what was to become an uninterrupted chain of 100 annual meetings.

There have been many reports on the events which prompted that meetings. The most authoritative would seem to be that of Dr. J. W. Connaway of Missouri, who attended the first meeting, served as president of the organization in 1931 and prepared a history of the organization of the United States Livestock Sanitary Association presented by an associate at the 50th annual meeting. Dr. Connaway was then 87 years old. His version of the beginnings:

"The United States Live Stock Sanitary Association emerged from a research background dealing primarily with Texas fever, in which the state colleges of agriculture of Missouri (Dr. Connaway was at the Missouri Experiment Station) and Texas entered upon a cooperative research project to discover the cause of the malady and to develop measures for its eradication. This Texas fever project was the first on record of cooperation between states on any project of mutual interest--Missouri's interest at the time being the menace of an unknown 'summer time' infection carried by the 'long horn' bovines from the south; the interest of the Texas cattle raisers--such as Robert Kleberg, manager of the King Ranch--was an open all-year-round market in the north, which the quarantine line cut off until the 'frost was on the punkin and the fodder was in the shock.'

"The immediate stimulus for the organization of this association was the publication of Missouri Bulletin 376 in January, 1897, on the subject of Texas fever. The bulletin confirmed the tick theory, which was first promulgated by southern cattle raisers-- primarily Kleberg, the father of ex-Congressman Kleberg, and proven by the brilliant work of Drs. Theobald Smith, F.S. Kilbourne and Cooper Curtice.

"Those having a pioneer part in laying the foundation that resulted in the establishment of the United States Live Stock Sanitary Association were Dr. Smith, Kilbourne and Curtice of the Bureau of Animal Industry, Connaway and Paul Evans of the Missouri Station, Mark Francis of the Texas Station, C. A. Cary of the Alabama Station and Nelson Mayo of the Kansas Station.

"The important incidents that led to the calling of the meeting at Ft. Worth, TX, in 1897, which resulted in the formation of this association, were outbreaks of Texas fever in Illinois, southern Missouri and Kansas. The secretaries of the live stock boards of those states were greatly concerned as to the spread of Texas fever and in correspondence concluded to hold a meeting at some undesignated place in one of those states. Word of this got into the papers and the management of the Ft. Worth stockyards, learning of it, sent an invitation to hold the meeting at Ft. Worth, where these yards had built a dipping vat, with the purpose of freeing cattle of the ticks for shipment north of the quarantine line for grazing purposes. The purpose of this meeting, which was held Sept. 28-29, 1897, and which really was the initial meeting of the U.S. Live Stock organization, was to urge the federal government to greater activity in the protection of the quarantine line. The purpose of the stockyards in maintaining a dipping vat was to create great interest in the dipping of cattle for the commercial shipment of southern cattle into northern territory."

The minutes of the first meeting of the Interstate Association of Live Stock Sanitary Boards were published as an addendum to the annual report for that year of the Illinois Board of Livestock Commissioners. C. P. Johnson, chairman of the Illinois Live Stock Sanitary Board, served as chairman of the meeting.

The importance of this issue to Texas cattlemen is illustrated by the representatives from that state who attended. In addition to Kleberg, other prominent Texas cattlemen who attended the meeting included Charles Goodnight, W. W. Turney and A. P. Bush.

Richard King, builder of the famous King Ranch, had been one of Kleberg's law clients. After King's death, his widow asked Kleberg to assume control of the ranch. Kleberg later married one of King's daughters. Kleberg expanded the ranch and set aside the site for the town of Kingsville. The cross of Brahma and Shorthorn cattle recognized by USDA in 1940 as the Santa Gertrudis breed was developed on the ranch situated at the fork of the Santa Gertrudis and San Fernando creeks. Kleberg played a major role in controlling cattle tick fever, as will be seen in the chapter on that disease.

Goodnight was one of the most colorful of those cattle barons. Born in Macoupin County, Illinois, he came to Texas in 1845 and in 1887 founded the first ranch in the panhandle of Texas. Earlier he had pioneered a cattle trail, along with partner Oliver Loving, through west Texas to New Mexico and then on to Colorado, which came to be known as the Goodnight Loving Trail. In 1869 when Coloradoans tried to turn back a Goodnight herd for fear of Texas fever, Goodnight loaded his shotgun with buckshot, armed his cowboys with Winchesters and riding in the lead of the herd, warned those in his way, "I've monkeyed as long as I want to with you sons of bitches," and forced the herd through. (The Cattle Kings, Lewis Atherton, Indiana University Press)

Bush, of Colorado City, TX, operated the Pitchfork Ranch of the Alabama and Texas Cattle Company. Turney was a lawyer in El Paso, TX, and also a prominent cattleman. He was president of one of the two Texas cattle organizations when they were merged in 1921 to become the Texas and Southwestern Cattle Raisers Association.

At the first meeting the Inter-State Association of Live Stock Boards (the hyphenated form of interstate was used intermittently) included attendance from state and territorial sanitary boards, state and territorial veterinarians and five delegates named by the U.S. Secretary of Agriculture. A second meeting was planned and a committee on constitution and bylaws was appointed.

The second meeting was Oct. 11-12, 1898 in Omaha, NE, in conjunction with the Trans-Mississippi Exposition. No proceedings of that meeting are available: the secretary of the association reported at the third annual meeting that because insufficient funds were received minutes of the second meeting were not published. He reported that 12 states paid annual dues of \$5 each.

During the 5th annual meeting in 1901, it was suggested that the meeting be held during the meeting of the National Live Stock Association. That proposal was rejected by those attending, who said they wanted the organization to stand on its own merits.

It was reported during the 7th meeting at Denver in 1903, that there were no minutes of the 6th meeting at Wichita, KS, owing to the failure of the stenographer employed for the meeting to transcribe his notes. The failure was ascribed to "incompetency and reluctance on his part to admit it." The secretary commented that he presumed "the medical phrases and professional terms used by the learned gentleman who discussed the weighty subjects considered at the meeting were too much for the stenographer after his notes got cold."

Stenographers were routinely employed for many years to take down every word during general sessions at the meetings. It wasn't until much later that separate committee sessions became a part of the meeting.

Even the jokes told by the speakers were included in the proceedings. For example, the president in 1907 noted "when the expenses of the organization are greater than the value

to the stock grower, then it should be abandoned." He illustrated this principle with the story of a prominent Oklahoma cowman who attended an ornate church in New York, arrived early and took the best pew. Presently an elegantly attired man entered the pew as services began, studied the cowman, drew from his fancy coat a fancy notebook, took out a gold-tipped pencil, wrote on a page, tore it out and handed it to the cowman. The note said: "I pay \$500 a year for this pew." The cattleman read it, fished a stub pencil from his vest pocket and wrote on the back of the note: "You pay too damn much."

An indication of how members traveled to these meetings is contained in a note in these proceedings that "none of the Kansas delegation had arrived, but they were expected at 3 o'clock on No. 5 over the Santa Fe."

The mayor of Denver was listed on the program to welcome the organization, but had not been asked in advance and could not be contacted on short notice. It had been arranged for the governor to present the welcome, but he was "also in a peck of trouble this morning and phoned that it would be impossible to attend."

No minutes of the 9th meeting at Guthrie, OK, were published. It was announced at the 10th meeting: "The papers were discussed so freely and rapidly by those present that the pencils of the stenographers literally burnt up the paper and their notes were unintelligible." There were problems with the stenographer during the 11th meeting as well; the one hired to record the minutes was called out of town after the first day, so all speakers were asked to send copies of their talks to the secretary. Proceedings of the meeting were published.

During the election at the end of the 10th meeting it was noted that the office of president was being passed around from state to state.

Dr. Daniel E. Salmon, named chief of the new veterinary division of USDA in 1883, which became the Bureau of Animal Industry (BAI) the following year, played a leadership role at the early meetings of the organization. The minutes of the 40th meeting in 1936 contained a comment by one of the leaders: "The spoils system, a heritage from Andrew Jackson, deprived the BAI of Dr. Salmon's leadership in 1905, a black mark illustrating the misuse of executive power." Salmon completed his professional career as director of a veterinary school in Uruguay until 1912 and then returned to the U.S. and worked in a hog cholera serum production plant until a recurrence of a pulmonary disease proved fatal.

During this period the system of accrediting veterinarians for work on disease control/eradication programs was begun and certainly was part of the discussions with state veterinarians. On June 1907 the BAI established a list of practicing veterinarians registered to inspect and test horses for exportation to Canada. The original list included 63 practicing veterinarians in 12 states.

The welcome to those attending the 12th meeting in 1908 in Washington, DC, was presented by Dr. A. D. Melvin, who had replaced Salmon as chief of BAI.

During the election at that meeting a question was raised whether BAI employees were eligible to serve as officers. It was pointed out that there were no constitution or bylaws specifying membership, but it was ruled that BAI employees were not eligible, since they were not members; only states were members.

A motion was approved to appoint a committee on constitution and bylaws, the first mention of this subject in the proceedings since the first meeting.

During a discussion of meeting dates the importance of setting the annual meeting either immediately before or after the American Veterinary Medical Association annual meeting was stressed.

By the 13th meeting in 1909 the secretary reported that the report of the previous annual meeting was so voluminous that he was afraid he would have to come to the meeting with a deficit, owing to the cost of printing. But he "kept sending dunning letters until 28 states paid dues of \$10." The secretary commented that he was embarrassed by people writing him wanting to know what constituted membership in the association, whether the \$10 dues were annual dues and who they covered. He suggested that the report of the 13th meeting would probably be bigger than the previous year and suggested a dues increase. Printing the proceedings the previous year had cost \$294.25.

Since the constitution committee appointed the previous year had not met and the chairman was absent, a new committee drafted constitution and bylaws that were adopted. They named the organization the United States Live Stock Sanitary Association and set up standing committees on publication, legislation, finance, credentials and resolutions. Membership would consist of any personnel engaged in live stock sanitary work for any governmental body, plus any other persons interested in live stock sanitation elected to active membership upon recommendation of the executive committee and a two-thirds vote of the members present. Annual dues were set at \$1 per member with other revenue expected from the sale of annual proceedings. The entire constitution and bylaws took up a little over one page in the proceedings.

Sixty-two people registered for that meeting and 40 paid dues. The proceedings listed state veterinarians and/or live stock boards in 48 states.

The proceedings of the 14th meeting in 1910 included a table of contents for the first time and noted that the minutes had been condensed to reduce publication costs.

That year dues totaled \$42 and it was noted that the organization was "certainly in a better condition now than ever before financially, with a balance on hand of \$339."

One of the resolutions called for appointment of a committee to formulate a code of ethics for the guidance of members.

At the 18th meeting in 1915, the executive committee proposed a change in the bylaws to provide that anyone engaged in live stock sanitary work could become an active member and all others would be associate members.

About 275 members were listed, dues revenue had climbed to \$206 and cash balances and reserves totaled \$1,214.

There was nothing in the proceedings of the 19th meeting the next year about the proposed membership changes, but there was action, for the only time recorded in the proceedings, to expel a member. The general session took up a recommendation of the executive and advisory committees to remove from membership Charles Graff of Bancroft, NE, for conduct unbecoming a member of the association. According to the secretary, Mr. Graff had been admitted to membership and attended the previous meeting, after which he prepared a "very scurrilous article" which he forwarded to Breeder's Gazette for publication. The article claimed that the organization was a clearing house for crooks and grafters, pirates and high-binders and blamed the organization for all the nefarious, crooked work done in the country. Graff said he had suspected the organization and attended the meeting for the purpose of spying on it and conducting an expose of the nefarious work being done by the organization. Breeder's Gazette sent the article to the secretary and he "pigeonholed" it. Mr. Graff then had many copies of the article reproduced and sent to editors of western live stock and farm papers. It was published in one farm journal and later replies by two of the USLSA officers were published. Apparently Mr. Graff then made the same charges in a talk to the organization. The motion to expel him carried unanimously.

By the 25th meeting in 1921, the organization was meeting in Chicago at the same time as the International Live Stock Exposition. The secretary reported 825 members, but only 268 had paid dues. During a general session discussion of finances, it was revealed that the organization was broke and had been unable to publish the proceedings the previous year until a printing company extended credit. Proposed were raising dues and accepting advertising in the proceedings and in the program; no advertising was ever published in the proceedings, but apparently advertising material was sent out with the program. The proceedings were back to verbatim accounts of everything said at the meeting, which had been discontinued for several years; all sessions were general sessions of all members.

The proceedings of the 26th meeting contained no financial report so there is no record of how the financial crisis was resolved.

By the time of the 30th meeting the organization was in the black, with nearly \$1,500 in the bank. The financial report showed 329 members paying dues of \$2, plus memberships at \$25 of 24 states, plus the Canadian Department of Agriculture and the BAI

At the 35th meeting, President J. W. Connaway in his address to the membership, said: "We should not allow our meetings to usurp the field and functions of the American Veterinary Medical Association; nor of the American Association of Animal Production, although some overlapping of activities may be unavoidable, and even desirable. The point I wish to stress is that the association has its own tolerably well-defined field to which it should devote its main energies. It is not a veterinary practitioners' organization. Their problems in general have no place in the deliberations of this organization. Every practitioner, however, should be a live stock sanitarian, since it is within his power to render in that capacity a valuable public service, and in that capacity his membership and participation in the meetings of this association should always be welcome."

By 1937, when the 41st meeting was held, there were 21 more state members, plus Los Angeles County, CA, paying \$25 dues; but individual membership had dropped to 185; savings and cash on hand totaled \$7,658.

The policy committee called attention to a "growing tendency to get away from the fundamental principles upon which the association was organized: by regulatory officials as a regulatory organization to be used for the dissemination of information relative to the control and eradication of infectious-contagious or dangerous diseases of live stock, including poultry."

The secretary noted that the program was becoming so full it was difficult to fit everything in three days and asked that committee programs be limited to three papers of 30 minutes each.

At the 50th meeting it was recommended that all committees of the organization meet during the afternoon of the day preceding the opening of the association meeting.

In his opening address to the 55th annual meeting in 1951, the president said it was the largest gathering of stockmen he had ever attended. He called USLSA a three-pronged organization: state officials, federal officials and the live stock industry. He also said he expected the constitution and bylaws to be a "hot" subject at this meeting. That prediction proved accurate.

At the previous meeting there had been a debate over the membership of the executive committee and its authority. It was then made up of representatives of state sanitary agencies and it had complete control; all committee reports were referred to the executive committee. Proposals included (1) expansion of the committee to include representatives of up to 10 national industry organizations; (2) making the executive committee administrative only, and (3) adding a stockman selected by the livestock association of each state to the executive committee. The latter proposal would have created an executive committee of nearly 100 members. The executive committee in 1996 contains 96 members.

When those attending the 55th meeting asked what happened to those proposals it was reported that the executive committee, which had authority to act on any amendments to the constitution and bylaws before they were submitted to the membership, had not approved any of the proposed changes.

Response of live stock producer members, including some prominent members of the organization plus the representative of the American Farm Bureau Federation, who said he acted on the authority of the board of that group, was to threaten to withdraw from USLSA unless changes were made in the executive committee.

Another try was made at the closing session in the form of a proposed amendment which would have added 10 delegates at large, selected from the live stock industry and chosen by the membership, to the executive committee. Another proposal was to add representatives of beef, dairy, swine, sheep, poultry, horse, railway freight and trucking industries, plus five others representing other industries. A third proposal was to delete from the duties of the executive committee the phrase "determine its activities and policies."

At the next meeting in 1952, the executive committee reported it had voted to continue to study the proposed amendments. That study resulted in no change and at the 57th meeting in 1953, the constitution and bylaws committee proposed adding eight delegates at large to the executive committee. That proposal apparently died as well, at least for a time.

At the 60th meeting in 1956, Secretary Hendershott proposed changing the name of the organization to the American Animal Health Association, in view of Canadian and Mexican membership. Another proposal was for junior membership. It was announced that a new record in membership had been attained with 1,080 members.

The 62nd meeting in 1958 was the first time the Conference of Veterinary Laboratory Diagnosticians was held in conjunction with the USLSA meeting. That prompted expansion of the meeting to four days, with the lab organization meeting the first day.

It wasn't until the 63rd meeting in 1959, that a change in the executive committee was approved. That year the constitution committee, with Dr. Clarence Campbell of Florida as a member, proposed addition to the executive committee of eight regional industry representatives. The committee noted that changes in the name of the organization had been discussed, but no change was recommended; however, American Livestock Regulation Officials Association was suggested.

The expansion of the executive committee finally occurred at the 64th meeting in 1960, with the addition of eight regional representatives. One of the first of those was O. H. Timm of California. He has served continuously in the position, except for the years when he was an officer, to this day.

The 65th meeting in 1961 was expanded to five days, with the diagnosticians meeting the first two days. A proposed budget for the next year estimated a deficit; net worth of the organization had grown to \$24,018.36.

In 1966, during the 70th meeting, President Clarence Campbell continued his involvement in the constitution and bylaws by appointing an interim committee on association affairs to completely revamp the organization. That committee proposed changing the name to International Animal Health Association, with five classes of members; official, allied organization, industry, regional delegates and nonvoting juniors. The allied organization membership would be open to nonprofit national organizations and they would be represented on the executive committee. The proposal also set up a board of directors, made up of officers, to administer the organization. The proposed changes took seven pages in the proceedings.

Apparently those changes, except for the name change, were approved the next year, although the proceedings contain no mention of that action. The name was again addressed with a proposed amendment to the constitution changing the organization to the United States Animal Health Association.

The incoming president at the 70th meeting suggested an organization newsletter and proposed a three-year term for committee chairmen.

At the 71st meeting in 1967, Ralph Hendershott retired after 24 years as secretary-treasurer. He noted that in 1943, when he assumed that office, the organization balance was about \$7,000 and when he left it was nearly \$32,000. Individual memberships totaled 1,300 and 467 attended the annual meeting. The proceedings of that meeting contained a proposed amendment to the constitution and bylaws changing the name to United States Animal Health Association. The proposal was submitted by John L. O'Hara, W. L. Bendix and J. W. Safford. The name change was approved at the 1968 annual meeting and was first used on the proceedings of the 73rd meeting in 1969.

W. L. (Bill) Bendix took over as secretary-treasurer at the 1968 meeting and reported hiring Mrs. Robert D. (Ella) Blanton as office secretary. Bendix mentioned applications for allied industry membership were being received as a result of the constitution changes. He also noted that seven organizations, in addition to the laboratory diagnosticians, were meeting during the 6-day meeting.

Mrs. Blanton, who was to become affectionately known simply as Ella by the members in future years, recalled that when the records of the association were moved to Richmond, VA, where Bendix was state veterinarian, many copies of past proceedings were moved, but only one box of records.

She recalls that membership at that time was close to 500, but only about 350 members were active. "We were located in the state office building and at first I had only a desk,

chair and typewriter. Then space on the first floor became available and we were able to set up an office with files, bookkeeping, etc. Dr. Bendix and the president, Dr. John Quinn of Michigan, quickly set about getting the committees together. At that time we had 28 committees." At the meeting in 1972, Bendix related that a flood caused by a hurricane in June of that year had filled the organization office, which was just two blocks from the James River, with mud and water to the tops of the doors, destroying back copies of proceedings and minutes of executive committee meetings. Ella recalls that the printer had called on Friday to inform them that the 1971 proceedings were ready to be delivered and she asked him to deliver them on Monday. Had they been delivered that day, they would have been lost in the flood. With the help of two boys, Ella tried to salvage what she could of the records and past proceedings. Hundreds of copies of proceedings were lost, including some of the very first ones.

The organization has replaced many of the lost annual proceedings through gifts of members from their sets, but the only known complete set, minus the years when proceedings were not published, is on the shelves of the USDA Agricultural Library in Beltsville, MD.

After the flood, the office was moved to Ella's home until office space could be secured, this time on the second floor.

Ella relates a story told her by Bendix that illustrates that there was still some dissatisfaction in the organization with the executive committee. Dr. Frank Wheeler of Louisiana was chairman of a committee and his report was rejected by the executive committee because of some controversy. He was told to take the report back to his committee, revise it and bring it back the next evening. After reading the revised report to the executive committee he said: "This is my report. It is written on toilet tissue and if you don't want to accept it, you know what you can do with it."

At the 80th meeting in 1976, Bendix reported 14 allied organizations were members with six applications pending. Bendix was then living in Florida during the winter months and felt that someone else should assume the chores of treasurer. Dr. John Shook was named treasurer, with Bendix continuing as secretary. Bendix retired as secretary in 1979 and Shook assumed the combined position of secretary-treasurer.

By the 90th meeting in 1986, the balance and savings of the organization had increased to \$105,953.

The proceedings of the 93rd meeting in 1989 contained a proposal to increase dues for governmental units and allied organizations from \$200 to \$300, which also included a seat on the executive committee, and for individuals from \$30 to \$45.

The APHIS animal health award that year went to John Armstrong, longtime chairman of the brucellosis committee, who followed in the footsteps of his predecessor Robert Kleberg as manager of the King Ranch and as a leader of the organization.

At the 94th meeting in 1990, the president appointed a special committee on constitution and bylaws, which reported at the 95th meeting in 1991. The proposed new rules for the organization took eight pages in the proceedings.

At the 96th meeting, President J. Lee Alley reported on a long-range plan for USAHA developed at a workshop by a group he appointed. The plan identified four potential goals and objectives of the organization: (1) address emerging issues of widespread industry, public and professional interest; (2) be a more effective forum by taking new approaches to coordination and communication; (3) have an organizational structure reflective of the mission, and (4) address the financial position from the perspective of professional managed organizations.

Additional changes in the constitution and bylaws were published in the proceedings of the 97th meeting. They included the following language on the purpose of the organization:

"The mission of USAHA is to be a forum for communication and coordination among state and federal governments, universities, industry and other groups on issues of animal health and disease control, animal welfare, food safety and public health. It serves as a clearing house for new information and methods which may be incorporated into laws, regulations, policy and programs. It acts to develop solutions to animal health-related issues based on science, new information and methods, public policy risk/benefit analysis and the ability to develop a consensus for changing laws, regulations, policies and programs."

Individual dues were increased to \$60, with the governmental/allied organization dues remaining at \$300.

The proposals also established a five-year limitation on the terms of committee chairmen. They also formalized the policy that USDA employees should not chair committees that make recommendations to their employer, but they could serve as vice-chairs and could chair committees that do not deal with federal agency policy.

The revised constitution and bylaws approved at the 98th meeting took 10 pages in the proceedings.

Ella retired in 1993, after 26 years of service to the organization. Mrs. Linda Ragland, who had started with the organization on a part-time basis in 1976 and became a full-time employee a few years later, replaced her as administrative secretary.

As the organization begins its second century of service to animals and their owners, as well as to consumers, net worth as of Dec. 31, 1995, stood at \$219,988.05.

Chapter 2--Committees, Resolutions

The committee structure, the major presentations and the resolutions approved at the annual meetings provide an insight into the activities and interests of the organization over the century.

At the first meeting, Texas fever was the subject, along with examination of a dipping vat at the Ft. Worth stockyards. It was suggested that tuberculosis be included on the program at the second meeting.

Dr. D. E. Salmon, chief of the BAI, was the opening speaker at the third meeting. He set the stage for what was to become a continuing cooperative relationship between USDA and the organization by calling for cooperation between sanitary authorities in different states, in order to secure uniform action. He pledged USDA to endeavor to follow, so far as possible, the recommendations of the organization, partly in recognition of the fact that they should be given great weight and partly because to do so raises the prestige and standing of the organization.

After a series of presentations on TB (discussed in more detail in the chapter on that disease), a resolution recognized that it was a contagious disease that was spreading except in unstabled beef herds, that tuberculin was the best means of recognizing the disease in live animals and that states should authorize measures to suppress the disease and prevent its spread and eradicate it where it has been established.

A resolution on sheep scab recommended the rigid enforcement of such measures as may be considered necessary to control it.

Committees meeting during the fourth meeting were those on line and open season (tick fever) and resolutions.

Resolutions asked Congress to protect states from livestock diseases carried in interstate commerce, urged increased funding for the BAI and adjusted the tick fever quarantine line and open season.

One paper on livestock sanitary conditions in Kentucky addressed the question: Does feeding cattle liquid distillery waste or slop render them immune to Texas fever? The speaker didn't think so, but would study the question.

Other papers were presented on TB and hog cholera control by the states.

Committees meeting during the fifth meeting were on open season, resolutions and the permanent zone (tick fever).

A paper on Texas fever noted that after the Civil War, cattle driven up the Chisholm Trail to rail heads in Kansas and Missouri and on to Illinois spread the disease; the first quarantines were imposed by shotguns.

Other papers were on TB, infectious abortion and anthrax.

Resolutions included the Texas fever quarantine and a neutral zone south of the quarantine line, requested studies on measures to stop the spread of TB and that BAI control interstate movements, including inspection of cattle.

While no proceedings of the sixth meeting were published, the resolutions from that session were included in the minutes of the seventh. One resolution called for disinfection of cattle cars used in transporting cattle north, except for slaughter.

A paper on anthrax noted the problem of disposing of the carcasses of infected animals.

A paper on cattle scabies or mange discussed its control and eradication.

Another paper discussed glanders, a widespread disease of horses and mules.

Questions were raised about how a diseased animal could be ordered destroyed without the payment of indemnity.

The president of the National Live Stock Association addressed the meeting and told of a cattleman who started with a train load of cattle in Texas and was stopped at every state through which the train passed, paying a fee ranging from a half to 2 or 3 cents per head. He said the inspectors inspected the cattle as the train passed by, "usually at a rate of about 15 to 20 miles per hour." A bill of health was made out and the cattle were passed when the fees were paid. "We instructed the owner to pay no more fees, but to protest and we took the case up and lost in every court we went into, until the Supreme Court said: 'If Congress will add one clause to the agricultural act as it now stands, the stockmen will be relieved.' Now the inspection of interstate shipments is in the hands of the federal government and one inspection is sufficient."

A major discussion at the meeting involved federal regulations on inspection and rail movement of cattle. Apparently differing interpretations of the regulations by federal officials were causing problems, especially in the west. One speaker said some railroad men told him the federal rule was ridiculous, simply nonsense and they intended to ignore it. This appears to be the first of many cases of state officials and the industry asking for regulations, but finding them onerous and unworkable after they had been imposed.

Another discussion involving rail transportation was probably the first time the organization had become involved in humane issues. A railroad representative made

reference to the 28-hour law (requiring livestock to be unloaded, fed and watered after 28 hours in transit), noting that "I will mention Rev. Jenkin Loyd Jones of Chicago and Dr. H. W. Thomas--excuse me for bringing that class of men here--but they have expressed for the last several years a desire to know more on the subject of humane handling of livestock." The president was instructed to appoint a committee to consider the question of handling and unloading of cattle for feeding during transit.

Resolutions urged:

That state laws protecting buzzards and crows be repealed because of their role in spreading livestock diseases.

That states protect other states from cattle scabies by preventing movement of infected cattle.

That states require cleaning and disinfection of rail cars used in transporting cattle from south of the quarantine line with the shipper of the cattle being responsible.

Endorsed an action taken at the previous meeting changing the name of Texas fever to tick fever.

Called on BAI to investigate the disease of anthrax and prohibit the interstate movement of animals infected with it.

In opening the eighth meeting, Dr. D. L. Luchey, the Missouri state veterinarian, said that while progress has been made in a number of diseases, "we have made mistakes. There has been an inclination to fight disease too much by proclamation. We have made regulations that are impracticable and had to back out at different times."

A press committee was appointed, recognizing comments at an earlier meeting on the difficulty of enticing the press to the meeting and also of bad press reports on livestock disease projects.

A paper was presented on prevention, suppression and control of communicable disease among domestic animals.

A discussion of lime/sulfur compared with commercial dips prompted a remark indicating that a commercial dip actually spread scabies, rather than curing it.

A committee was appointed to consider the "advisability of a recommendation to the various states on uniformity of state veterinary and sanitary legislation."

The committee on humane treatment of cattle during shipment supported the 28-hour law and condemned rough handling and the use of prods with metal points; "a sharpened stick

of wood deemed sufficient in all cases." The latter point was disputed by one of those attending who said it was "impractical to handle some classes of range cattle without them (prods with metal points)." A motion to extend the 28-hour period to 40 hours before feeding and watering was tabled.

While no minutes were available of the ninth meeting, the next year a summary of that session was published, including a resolution that "the time has arrived for active and substantial assistance and cooperation by the federal government with the southern states in their efforts to exterminate the southern cattle fever tick."

Papers were presented at the 10th meeting on the effectiveness of dipping cattle for fever ticks, on the "business end of live stock sanitation"--how to interface with the business interests involved in the industry; transportation companies, public stock yards and packers.

Resolutions called for states to inspect local slaughter plants exempted from federal inspection and for an increase by states in the number of humane agents and placing them under the jurisdiction of the state live stock sanitary boards.

At the 11th meeting in 1907, the president of the association noted that "we have already witnessed the banishing from this continent of two diseases--contagious pleuropneumonia and FMD--as well as the almost complete annihilation of glanders and have watched the control of tick fever to the point of such perfection that few of the stock raisers of this country today realize there is any danger of loss from it." He said the three great foes which are "worthy of our best mettle, in the order of importance, are TB, hog cholera and the fever tick."

A paper addressed rabies and its control, the first time that disease had been on the association meeting agenda.

Resolutions called for:

An increase in federal funding for tick eradication of not less than \$500,000; cooperation of state and federal authorities to eventually wipe out TB and hog cholera, state supervision of milk supplies and required testing of all dairy cows with tuberculin.

At the 12th meeting in 1908, new committees were appointed to collect state sanitary laws and to draw up a model state sanitary law.

A paper was presented on prevention of hog cholera by serum immunization.

Committees met separately from the general session, during the evening hours.

An entire day was spent on TB, and presentations were also made on tick eradication, glanders and on three diseases of increased importance--infectious anemia (swamp fever), mycotic lymphangitis (pseudo-farcy) and chronic bacterial dysentery (John's disease).

Resolutions urged:

States to fund hog cholera vaccine manufacturing; public watering troughs be closed during an outbreak of glanders; states eradicate TB from herds at state institutions, require tuberculin testing for show cattle, require mallein tests for glanders, states require muzzling of dogs where rabies exists and a change in federal law to permit interstate movement of TB-infected cattle for slaughter. A resolution condemned the distribution of tuberculin to other than veterinarians.

At the 13th meeting in 1909, the committee on state laws and regulations reported that 31 states had provisions to prevent the importation of diseased animals.

Papers were presented on mange in cattle and on glanders, which noted that the disease is no longer of much importance, since in a few years the horse will probably have become obsolete in view of the new method of transportation, the automobile.

A paper on veterinary tetanus antitoxin, with special reference to federal supervision of biological products, included the first tables found in an annual proceedings.

A paper on disposal methods for carcasses of animals dead of contagious and infectious disease prompted a suggestion that, not only should the laws making it a crime to kill buzzards be repealed as recommended earlier, but that rewards be offered for the destruction of buzzards.

An entire morning was spent on papers on TB eradication.

Resolutions addressed:

Increased federal funding for tick eradication.

Repeal of laws protecting buzzards and carrion crows and calling for rewards for their destruction.

Support for legislation to empower the Secretary of Agriculture to exercise control over biologic products and viruses in agriculture.

A new committee surfaced at the 14th meeting in 1910, on the nomenclature of swine diseases.

The committee on tick eradication, no longer the line and open season committee, made recommendations on the quarantine line, while other committees proposed standards for good state live stock sanitary legislation, urged the BAI to develop a health certificate for use with interstate shipments and urged the development of a definition of hog cholera.

A resolution asked the association to develop recommendations for the control of pernicious anemia in horses.

There were 19 general session presentations on subjects including tick eradication, oesophagostoma inflation, hog cholera serum, TB, milk sanitation and equine anemia.

During the 15th meeting the committee considering a uniform health certificate reported that the BAI considered it impracticable to supervise the inspection and testing of livestock in the different states as recommended by the committee, but had prepared a health certificate for use by BAI inspectors and suggested that the states adopt it.

A TB committee was listed along with those that had functioned in the past.

The committee on swine diseases defined hog cholera and salmonellosis, which formerly had been described as hog cholera, and listed symptoms of each.

Resolutions urged:

USDA to supervise production of all veterinary biological products; that production and distribution of hog cholera serum, virulent blood and vaccines should be under the direct supervision of state authorities; distribution of information on the serious importance of infectious abortion among cattle and horses.

Papers were presented on contagious abortion in cattle, dourine, glanders, hog cholera, the milk supply and dairy sanitation, rabies, tick fever, TB and sanitary control of livestock.

There were presentations on tick eradication, blackleg, hog cholera, spread of disease through garbage and trichinosis.

Resolutions adopted at the 19th meeting:

Urged states and the federal government to be liberal in appraisals of animals destroyed because of FMD.

Opposed appointment as chief of the BAI of anyone lacking scientific training and experience in dealing with animal diseases, in response to criticism of the BAI and support for naming a nonscientist to head it.

Committees listed in the proceedings of the 15th meeting in 1921 included tick eradication, hog cholera control, livestock diseases, infectious abortion, interstate shipment of swine, special skin diseases, TB and FMD.

The president of the association took notice of the earlier prediction in the 1909 proceedings that the horse would become obsolete. He pointed out that glanders "is practically eradicated and it was not eradicated by the elimination of the horse. Gas power is too expensive to be used profitably on the farm," he added, pointing to "the falling off in the purchase and use of tractors and the increase being made in breeding of horses."

A session at that meeting on abortion disease resulted in endorsement of a recommendation by an AVMA committee urging development of a better name for this disease condition in cattle--one member of the committee said he believed the causative agent was *Bacillus abortus* (Bang).

The swine disease committee called for differentiation in diagnosis between hog cholera, infectious enteritis (necrotic enteritis) and hog "flu."

Meeting at the 30th annual session in 1926 were new committees on nutritional diseases, contagious abortion, poultry diseases, parasitic diseases, meat and milk hygiene and miscellaneous transmissible diseases.

Committee reports that year were summaries of the disease situation, plus presentations on research, all during general sessions of the organization with few, if any, recommendations and no resolutions. By the 35th meeting in 1931, new committees included Bang's disease, transmissible diseases of poultry, and transmissible diseases of swine.

The president of the association commented that he had never seen swine erysipelas (rotlauf in Germany, rouget in France) in America.

There was a presentation on the problems in controlling and eradicating Johne's disease.

Resolutions included:

That use of the word accredited be restricted to indicate health alone and that it not be employed in any other capacity.

That the BAI be asked to assemble and distribute to state sanitary officials a monthly bulletin covering current events in live stock sanitation through North America and the world.

By the 40th meeting in 1936, a committee on rabies had been added.

Papers were presented on equine encephalomyelitis and on vesicular exanthema (VE) in California.

The next year committees were added on uniform interstate certificates and meat inspection of poultry.

Resolutions included:

That a program be inaugurated for protecting swine from infestation with trichinosis, urged cooperation with public health officials in control of known sources of infestation, noted that feeding of raw garbage is a medium for dissemination of the parasite and urged caution with regard to publicity about the program.

Meeting the week before the U.S. entered World War II in 1941, the president referred to the commitment in food that had been made to the British as a challenge to the livestock industry, requiring, for example, an increase of 50 percent in the production of milk. That prompted suggestions that the Bang's disease program be modified to keep high-producing reactor cows in production. He also estimated that the country needed to raise 9 or 10 million more hogs, which would have implications on hog cholera control.

The organization had a new committee on biologics. For the first time, no tick eradication committee was listed.

Resolutions urged:

That metal be allocated for production of noncorrosive eartags for livestock.

That the 28-hour law be amended to apply to transport in trucks as well as trains.

These committees were listed in the proceedings of the 50th anniversary meeting: anaplasmosis, biologics, brucellosis (no longer Bang's), community auction sales, laws and regulations, legislation, meat and milk hygiene, morbidity and vital statistics, parasitic diseases, policy, rabies, transmissible diseases of poultry, transmissible diseases of swine and TB.

Resolutions included:

Urged all serums, viruses and other biologics be produced under authority of a license issued by the BAI and that agency exercise authority over the interstate shipment of all products that contain a living organism capable of producing disease in animals.

That the official interstate health certificate be a prerequisite for the interstate movement of livestock by truck, as well as by rail.

That a disease of poultry variously known as avian pneumoencephalitis, Newcastle disease, avian pest and other names, be officially known as avian pneumoencephalitis.

The proceedings of the 51st meeting in 1947 noted that World War II had stopped many state programs.

New committees listed for the 55th meeting in 1951 included biologics and pharmaceuticals, FMD, infectious diseases of cattle and national eradication of hog cholera.

Papers were presented on coccidiosis in cattle, eradication of sheep scabies, poultry inspection, control of rabies, Newcastle disease, fowl pest, infectious bronchitis (the speaker noted that control methods involved propagating the disease), veterinary medical statistics (it was reported that 30 years before, the organization appointed a committee for what they called morbidity and mortality, but such statistics were still not available).

Also, papers were represented on atrophic rhinitis and edema disease of swine.

New committees that met at the 60th meeting in 1956 included an advisory committee to the Agricultural Research Service, stockyards, markets, transportation, vesicular diseases, public health, regulation eradication and swine brucellosis.

Resolutions included:

FDA require that mastitis antibiotic products contain a dye that would show up in milk.

A call for research and strengthened regulations for control and eradication of sheep scabies.

New committees meeting during the 65th meeting in 1961 included biologics and pharmaceuticals as separate groups, foreign animal diseases, diseases of sheep and goats and animal virus classification.

A resolution was approved calling for all animals in interstate or intrastate commerce to be identified by eartag, tattoo, backtag or brand to trace to herd of origin.

By the 70th meeting, the animal virus committee had been renamed to animal virus characterization. New committees included infectious diseases of horses, mastitis, regulatory veterinary medicine resources, salmonellosis and state-federal relations.

One of the resolutions urged completion of eradication of sheep scabies and increased inspection activity for cattle scabies. Another promoted formation of a national rabies council.

During that meeting in 1966, a symposium on the future of garbage feeding to swine was sponsored by three committees. That session attracted to the annual meeting for the first time a new group of producers--feeders of garbage to swine. Members of the group were regular attendees at hog cholera and other committee sessions for many years.

By the 75th meeting in 1971, these new committees had been created: animal welfare, evaluation and development of state-federal programs, import-export, livestock commerce, livestock identification and professional relations.

The organization had called attention during the two previous years to the potential risk of Venezuelan equine encephalomyelitis (VEE), and it did spread to the U.S. during that year. A special meeting of the executive committee was convened to clear up confusion regarding the disease, to reduce state barriers and get on with vaccinating horses.

Resolutions included:

Support for required vaccination for VEE of horses moving interstate, as well as 11 other steps to control the outbreak.

By the 80th meeting in 1976, these new committees had been appointed: epizootic attack plan, environmental residue, food animal hygiene and inspection, TB and Johne's disease, and zoological animals.

Resolutions were approved calling for more funding for all-out calfhood vaccination for brucellosis, more funds for cattle scabies eradication, and opposing the completion of the Pan American highway through the Darien Gap in Panama and Columbia because of the risk of transmission of FMD.

By the 85th meeting in 1981, these new committees had been formed: bluetongue and bovine leukosis, morbidity and mortality, PRV and wildlife diseases.

It was noted during the meeting that the swine health protection act providing federal garbage feeding regulations had been passed the previous year. African swine fever in Haiti was a discussion subject.

A resolution called for development and implementation of a practical, reliable program to eradicate avian mycoplasmosis from multiple layer farms.

By the time of the meeting in 1986, the 90th, these new committees were listed: anaplasmosis, biotechnology, Johne's disease and transmissible diseases of swine.

Resolutions called for:

Investigation of improved sanitation and processing to reduce salmonella contamination in rendering plants and animal by- products;

Field trials on disease transmission through embryo transfer;

Support for bont tick eradication in the Caribbean;

The Department of Interior to cooperate on the problem of brucellosis in the Yellowstone Park bison herd;

Three resolutions from the sheep and goat committee on nematodirus battus;

A surveillance program for bluetongue;

Implementation of an '85 M branding recommendation; and

Warning of the rabies risk of wild, exotic animals as household pets.

New committees created for the 91st meeting were aquaculture, hemoparasitic diseases and infectious diseases of cattle, bison and llama.

The proceedings of the 94th meeting listed 35 committees, with membership numbering up to 50.

A feed safety committee was appointed by the 95th meeting in 1991.

Resolutions approved at that meeting called for:

Controls on white-tailed deer and exotic wildlife to promote tick eradication;

Development of a diagnostic method for swine infertility and respiratory syndrome.

The proceedings of the 99th meeting of the organization lists these committees:

Animal disease surveillance and animal health information, animal welfare, aquaculture, biologics and biotechnology, bluetongue and bovine retrovirus, brucellosis, captive wildlife and alternative livestock, environmental residues, epizootic attack, feed safety, food safety, foreign animal diseases, government relations, hemoparasitic diseases, import-export, infectious diseases of cattle, bison and llama, infectious diseases of horses, Johne's disease, leptospirosis, livestock identification, nominations and resolutions, parasitic diseases and parasiticides, pharmaceuticals, professional oversight, psuedorabies, public health and environmental quality, public relations, rabies, salmonella, sheep and goats, transmissible diseases of poultry, transmissible diseases of

swine, tuberculosis, wildlife diseases.

Chapter 3--Cattle Tick Fever

This disease is one of the oldest in recorded history, having been reported in France, Italy, Turkey, West Indies, Mexico, Central American, South America, Australia, Africa, Ireland, Finland, southern Russia, China, Java, Borneo, Philippine Islands and Rumania. It appears that it entered the U.S. through importation of cattle from the Spanish Colonies of the West Indies Islands and Mexico. Although cattle are known to have been imported from these sources as early as 1610, it is not known just when the disease first appeared in the livestock of the American Colonies. The history of tick fever is described in detail in a history of the United States Livestock Sanitary Association published in the proceedings of the 54th annual meeting, author not indicated.

The first reports of the occurrence of Texas fever, as it came to be known, did not come from that portion of the southern area of the U.S. where the disease was supposed to be common, but from areas to the north where the disease had been carried by the movement of cattle from the south.

One of the earliest reports of the disease occurs in a lecture by Dr. James Mease on Nov. 3, 1814, before the Philadelphia Society for Promoting Agriculture. He called attention to the fact that cattle being driven northward from South Carolina left a trail of fever in all herds with which they came in contact. Mease said these cattle infected others while they themselves remained healthy and that cattle from Europe or the interior, when taken to the seacoast south of Virginia, were attacked by the disease and it generally proved fatal.

It was reported in 1867 that cattle seldom contracted the disease unless removed from where they were raised; if they were taken from the mountain country to the low country in Georgia, they soon contracted the fever and died without transmitting the disease to the native cattle. Cattle taken from the low country into the mountains continued to improve, while they communicated the infection to animals with which they came in contact, but after remaining in the colder country for a time they lost the power of communicating the infection.

By the early 1800's, both North Carolina and Virginia had restricted movements of cattle from the south. As settlers moved westward and established cattle herds, the method of driving stock overland gradually spread the disease over the entire south and frequently to sections in the north. By 1877, it was the cause of much alarm throughout the country, especially along transportation and trail routes. Invariably, where cattle from Texas or other southern states were driven to northern markets, they left disease and death in their wake.

By far the greatest losses seemed to occur by driving Texas cattle through Missouri, Kansas, Arkansas and Indian Territory for distribution as feeders to the various western states.

In 1852, "Murrain" was reported as highly destructive in Missouri and from 1858 to 1861 it had increased to such an extent along the Texas cattle trails that Missouri in 1861 passed laws to regulate the movement of herds from the south. Other states soon followed suit. The people in these states were aroused to great indignation because some Texas cattlemen persisted in driving their herds north; armed parties confronted and turned back the invading herds.

The Texas Almanac, 1949-1950, records the fact that Baxter Springs, MO, lost a great chance as a trail terminal when Missouri farmers in 1866 established a "shotgun quarantine" against the passage of trail herds from Texas. James Daugherty, later of Abilene, TX, was flogged by a mob of Missouri farmers on a drive to Baxter Springs.

The disease ceased in all these border states during the Civil War, when Texas cowboys went to war and Texas cattle ran wild. After the war when those wild cattle were captured and driven north to market, the disease reappeared.

In order to avoid the hostile opposition in the adjacent states, Texas cattlemen were forced to resort to shipping their livestock up the Mississippi River by boat. By 1867, Cairo, IL, became the chief point of transshipment of cattle from steamboat to railroad. During the spring of 1867, about 30,000 cattle were landed at Cairo and while most were slaughter stock and went direct to abattoirs, the disease spread to many native herds in southern Illinois. Many of these cattle were shipped east by rail and spread the infection into the heart of the country from Illinois to Massachusetts.

By 1879, cattle owners in many parts of the country were in great consternation and alarm. No one knew of a remedy, or why only southern cattle communicated the plague, nor why the disease disappeared in the winter. No one could comprehend how perfectly healthy southern cattle could convey such a deadly disease to northern cattle, while the northern cattle sick with the malady seemed unable to transfer it to others.

In 1869, after a study commissioned by the Department of Agriculture, a European scientist and a U.S. botanist concluded that the disease might be associated with the grass grazed by cattle, but "there is not the slightest foundation for the view that ticks disseminate the disease."

In 1879, a young veterinarian, Dr. D. E. Salmon, was appointed by the Commissioner of Agriculture to investigate animal diseases in the southern states with particular reference to Texas cattle fever. Although the cause was not determined, Salmon noted that northern cattle developed the disease when allowed to graze on the trails of cattle from the south or in pastures occupied by them. He felt in order to protect northern cattle it would be necessary to establish a quarantine line across the country and regulate the movement north of cattle originating south of the line.

During this period, the cattle tick, with which southern cattle were generally infested, was suspected by cattlemen as being connected with the spread of the disease, but this tick theory was generally discounted by scientists.

In 1883, Salmon established about 200 miles of the quarantine line extending from the Atlantic Coast westward through Virginia. The line was extended to the Mississippi River in 1884, to the Rio Grande River in 1885 and to the Pacific Coast in 1895.

Quarantines to support the line were issued beginning in 1889 and by 1892 they covered much of the south.

In "100 Years of Animal Health," it is reported that in 1891 several Kansas cattlemen prevailed over the BAI in a well-publicized incident. The men bought cattle in Ft. Worth for their pastures in the flint hills of Kansas. After the BAI inspector declared them free of ticks and Texas fever, several of the cattle sickened and died soon after they were placed on the pastures. The cattlemen sued for \$270,000 in federal compensation on the basis of negligence of the inspector. After repeated hearings before Congressional committees, a bill was passed in Congress allowing the suit and eventually a federal court in Kansas City awarded the men \$251,000 in damages.

It was the location of the Texas fever quarantine line and the months when movements of cattle from the south to the north would be allowed that took much of the time of the new Inter-State Association of Live Stock Sanitary Boards created in 1897.

Scientific views on the tick theory were changing and by 1889 the tick had been established as the vector for Texas fever.

Photo #5.

After several years of controversy, in 1889 it was established that the cattle tick was the vector for Texas fever. (USDA photo)

While there was continuing controversy over the cause of the disease, Robert Kleberg, manager of the King Ranch, was convinced. He is reported to have told the Secretary of Agriculture: "If the tick carries this disease, as your investigation seems to show, I will get rid of the tick." He dipped about 20,00 head of cattle on his ranch in an attempt to demonstrate the efficacy of the method, having designed and built the first vat used by the BAI in its dipping investigations.

The vat was placed at the disposal of the Bureau in 1895, together with the ticky cattle on the King Ranch.

In August of 1897, the Ft. Worth Stock Yards Company built a large dipping vat and placed it at the disposal of the Bureau, so the experiments that had been carried on at the King Ranch were transferred to Ft. Worth.

According to the history of the association published in the proceedings of the 54th meeting, in 1897 many of the states had regulations against the movement of southern cattle across their area, except during the cold months of the year. The federal tick quarantine line was being violated, so several state officials were making plans to meet for the purpose of presenting a united request for greater aid from the federal government in policing the line.

An official of the Ft. Worth Stock Yards encouraged the state officials to delay the meeting until the results of the dipping studies there could be reported and the dipping vat demonstrated. That request resulted in the first meeting of the association that became USAHA in September of 1897.

According to the minutes of that meeting, its purpose was to discuss a uniform system of inspection and quarantine for southern or splenic fever (cattle tick fever, Texas fever) and also to report on preliminary studies to determine the value of dipping to eliminate the southern cattle tick which was believed to spread the disease.

In a well-researched history of the Ft. Worth Stockyards (Livestock Legacy--The Fort Worth Stockyards 1887-1987, published by Texas A&M University Press), J'Nell Pate reports:

"The Stock Yards Company constantly sought to promote its market and in 1897 found a unique way. Recognition came to the company concerning its cooperation with the federal government in tick eradication. Earlier, farms of Kansas, Missouri and others states had complained that Texas longhorns driven up the trail brought a disease to their domestic cattle, causing them to sicken and die. Although many ideas existed about what caused this Texas fever, no one actually knew for sure in the early days. When the British and later the Germans threatened to cut off American livestock shipments because of diseased animals, the federal government finally decided to take some steps for inspecting and quarantining cattle. The Bureau of Animal Industry, created in 1884, soon went to work to discover the cause of Texas fever. Dr. Theobald Smith and Dr. Fred L. Kilborne, Bureau scientists, proved conclusively in 1889 and 1890 that particular cattle ticks caused it.

"Dr. Victor A. Norgaard, who later became chief of the pathological division of the BAI, began conducting dipping experiments in Texas. Robert Kleberg, manager of the Santa Gertrudis (King) Ranch in Nueces County, designed and built the first vat used by the bureau in its dip investigations. He had been using it to dip for mange and itch. Kleberg offered his vat to the bureau early in 1895, together with the infested cattle on the ranch. During the next five years, 25,000 cattle passed through this vat in testing the tick-

destroying properties of various disinfecting preparations. The best results during the first year came from the use of two coal-tar preparations.

"Ever with an eye to helping business and calling attention to their market, the Fort Worth Stock Yards Company, early in the summer of 1897, offered to build vats and furnish the cattle for experimental purposes if the bureau would do their dipping at Ft. Worth. Bureau officials agreed, so the Ft. Worth sponsors built a battery of dipping vats on the property that later would become the site of the Swift and Company packing plant.

"The government transferred the experiments from the south Texas ranch to the Ft. Worth yards in August, 1897, and began testing some so-called paraffin lubricating oils. The results obtained with these oils from the first proved so satisfactory that in September officials called a meeting at Ft. Worth to demonstrate dipping with this substance.

"Rancher Kleberg made a motion at the March, 1898, Cattle Raisers Association convention to thank the Ft. Worth Stock Yards Company for 'dipping of cattle; they have gone to great expense, not less than \$5,000 or \$6,000 expended there in order to make these experiments.'

"Officials resumed the experiments with paraffin oil at the King Ranch April 1, 1898, where they found more tick-infested cattle available. That June, government officials experimented again at Ft. Worth using 'extra dynamo oil.' After a few trials they added sulphur to this oil. The results seemed so promising that officials decided to test it on quite a large number of cattle and then ship them north immediately after dipping. Accordingly, they dipped 311 cattle on July 22 and shipped them to Rockford, IL, the following day. The hot weather caused the cattle to suffer severely in transit. The oil killed the ticks, but eight cattle died en route and eight 'downers' were left behind at unloading stations.

"Scientists tried other dips containing carbolic acid, tobacco extract, sodium sulfate, glycerine or a combination of lime and sulfur. Finally crude petroleum oil from Beaumont gave better results than any other crude oil or dip, and cattlemen used it almost exclusively from 1903 to 1911 as a spray, a smear and a dip for freeing cattle of ticks.

"The state of Texas made its own attempts to help solve the cattle tick problem as the state legislature, on April 20, 1893, created the Texas Livestock Sanitary Commission. The Ft. Worth Stock Yards became the state headquarters for the commission almost from the beginning. The legislature gave the commission so little power, however, that it accomplished little until 1917, when the legislature conferred upon the commission the authority to enforce compulsory dipping of cattle. After that, when many counties neglected or refused to provide for the dipping of infested cattle, the commission forced the issue by clamping a state quarantine on the counties until they dipped all cattle twice.

"Conservative Texas cattlemen were slow to accept the scientific results of the dipping tests. They formed anti-dipping groups and even blew up dipping vats in both Texas and the Indian Territory. Texas ranchers, understandably worried more about how many cattle died after being dipped than how fast the ticks disappeared. A man from Quanah reported that he dipped 321 head of cattle at the Ft. Worth Stock Yards on Oct. 28, 1898. Six died, 10 heifers lost their calves and the rest became stiff and sore. The owner feared that one norther would kill them. All letters quoted by the Texas Live Stock Journal in the same issue as the Quanah man's account opposed dipping."

In addition to the location of the quarantine line and the months when movements would be permitted, the materials to be used in dipping cattle were major discussion topics at the early meetings of the new national association. The best results were obtained during the first year of trials from the use of chloranapholeium and Lone Star cattle and sheep wash, two coal-tar preparations. Also discussed were the relative merits of single, double or triple dipping of the cattle.

It was reported at the meeting in 1899 that the dipping procedures being tested would free southern cattle of the tick, but injured the cattle to such an extent that it could not be recommended. It was speculated that the oil used in the trials was refined with sulfuric acid. A residue of the acid remaining in the oil apparently was what destroyed the ticks, but damaged the cattle. Oils refined without sulfuric acid didn't injure the cattle, but didn't kill the ticks either.

The materials used for dipping prompted a resolution at the meeting in 1903. The BAI was requiring lime/sulfur for dipping done under federal supervision, but cattlemen preferred commercial preparations. A proposed resolutions said lime/sulfur dip "is difficult to prepare, dangerous, must be used hot to be effective and even then has been found to be no more effective than commercial preparations which are more easily prepared and applied." The references to lime/sulfur were stricken from the resolution and it simply asked BAI to test alternate dips and allow their use for dipping cattle in interstate trade when they proved effective. The commercial preparations included creosote and carbolic acid.

Committees continued to discuss the quarantine line and the open season period for shipment of southern cattle, as well as the effectiveness of cattle dips. The BAI eradication effort against fever ticks and tick fever, stimulated by the Livestock Sanitary Association discussions and begun in 1906, was reported by the annual meeting the next year to have successfully eradicated the tick from a number of counties in Virginia, North Carolina and Oklahoma.

Progress continued with reports and discussion of the quarantine line at each annual meeting and by 1937 it was reported that the quarantine area had been reduced to less than 12,000 square miles in Florida and Texas. Deer were shown to carry the fever tick in Florida and measures to remove the deer from the quarantined areas were approved by

the state legislature, but hunters obtained an injunction against the law so that program was in the courts.

In 1943, the problem that had stimulated formation of the association was declared eradicated and a quarantine zone was established in the Lower Rio Grande Valley of Texas. More than 30 years later, ticks moved out of that quarantine area, and the organization at its meeting in 1976 called for the declaration of an emergency and funding for an eradication effort. In 1982, Congress authorized federal tick riders to carry firearms, so "Texas fever" had come full circle, from cowboys carrying firearms to force cattle drives past "shotgun quarantines" by those opposed to the cattle movements; to inspectors carrying firearms to protect themselves while examining cattle for ticks.

Chapter 4--Tuberculosis

Bovine tuberculosis has concerned the United States Animal Health Association throughout its 100-year history and is still a concern as the century closes. While there is no record of discussions of TB at the initial meeting of the organization, a request that TB be a subject for the second meeting was recorded.

Since no records of that second meeting have been preserved, that discussion is not available, but at the third meeting in 1899, TB was a major discussion topic. Those attending were invited to observe postmortems on cattle that reacted to the tuberculin test, which had come into use to find infected animals, but was still controversial and remained so for many years.

A paper, one of a series on the disease, discussed infective possibilities from tubercular milk. The general conclusion was that the milk of all cows reacting to tuberculin is infectious, therefore the tuberculin test is of much greater significance than physical examination of the cattle in finding diseased animals.

A paper on control of TB including the following: "There is now consensus to the effect that some control should be exercised over tubercular cattle. The growth of public opinion on this question is interesting and instructive. At first there was violent opposition to any action on this question and it was denied that tuberculosis of cattle was a disease of any consequence. Then, when the tuberculin test came into use, it was objected to most strenuously and all sorts of unfounded objections to it were made and the most dismal prophecies as to the results of its use were published. At the same time there appeared a demand on the part of health boards and people in cities that their meat and milk should be protected from contamination with tubercle bacilli. Active controversies were instituted between the consuming public, represented by the daily papers and some sanitarians, on one side, and producers, represented by the agricultural press, on the other. On one hand, the dangers from tuberculosis meat and milk were set forth and were sometimes highly colored and exaggerated, while on the other hand, they were minimized and facts concerning them were suppressed."

A resolution recognized TB as a contagious disease that was spreading except in unstabled beef herds, that tuberculin was the best means of recognizing the disease in live animals, that states should authorize measures to suppress the disease to prevent its spread and eradicate it where it had been established.

At the 1901 meeting, a paper discussed the role of education in the success of sanitary reforms and it was commented from the floor that leading agricultural publications had been fighting sanitary boards in the matter of the tuberculin test; *Breeders' Gazette*, *Country Gentleman* and *Hoard's Dairyman* were mentioned.

Reports on TB continued during each annual meeting in the ensuing years while the BAI began requiring tuberculin testing of imported cattle. In 1904, the president of the association pointed out that tuberculosis was causing the loss of more than 160,000 lives annually. "Certainly we have plenty of evidence that the livestock that this association is responsible for have much to do with this great loss," he said. He commented on the controversy about whether the disease in animals was transmissible to man: "It has been demonstrated beyond a doubt that the disease is transmissible from animal to man." A committee was appointed to gather evidence on that subject.

The controversial "bang" system of eradicating the disease was discussed. It involved high-value animals that were infected. The cows were isolated as soon as they calved and the calves were reared away from the cows on nurse cows or on their dams' milk after it had been sterilized. This would allow the owner to keep the cows for one or two years.

The disposition of TB cattle and of TB reactors was a major issue, along with the difficulty in finding a slaughterer for them.

A special committee on TB called for use of the "bang" method in disposing of TB cattle in some herds with valuable cattle that could be safely and profitably handled in this matter; in all other cases, TB cattle should be destroyed; reactors should be shipped to slaughter under supervision.

There was continuing controversy regarding the tuberculin test; a paper presented at the meeting in 1906 noted: "We have made a mistake in holding the tuberculin test as infallible or anything like it. Postmortems on reacting cattle which showed no lesions of the disease have done a great deal to prejudice the public against the law."

Discussion at that meeting centered on whether and how TB could be transmitted from humans to animals.

State reports indicated a wide variation in control measures against the disease. A paper on animal breeding included discussion of studies on breeding resistance to TB.

In 1905, the BAI had undertaken the immunization of cattle against the disease and the next year inaugurated a plan for eradication of TB in the District of Columbia, which was soon expanded to include parts of Maryland and Virginia.

The disposition of infected cattle continued to be a problem, as indicated by a paper on purchase of cows for slaughter subject to passing a postmortem inspection. It was reported at the meeting in 1907 that TB accounted for 95 percent of condemnations at slaughter of both cattle and hogs.

A resolution called for state supervision of milk supplies and required testing of all dairy cows with tuberculin.

TB was a major discussion topic again at the meeting in 1905, including the disposition of TB cattle and TB reactors, along with the difficulty in finding a slaughterer for them. Discussions revealed some controversy regarding the tuberculin test. A committee was appointed to gather evidence on whether or not bovine TB is communicable to humans.

The 1908 meeting approved resolutions calling for states to eradicate TB from herds at state institutions, requiring tuberculin tests for show cattle and condemned the distribution of tuberculin to other than veterinarians. Also that federal laws be changed to permit interstate movement of TB-infected cattle for slaughter.

The disease continued to interest the organization; at the meeting in 1909, an entire morning was spent on TB.

The entire program continued to be controversial, as evidenced by the resolution adopted in 1911 deploring action by the Illinois state legislature in removing all restrictions on movements of TB cattle, either into or out of the state, and ending use of the tuberculin test.

A resolution approved at the 1915 meeting favored the general plan of registration of TB-free herds of purebred cattle as recommended by the International Commission on Control of Bovine TB. The committee on legislation noted that Illinois had again recognized the tuberculin test and was controlling movements. All but two states had given official recognition to the tuberculin test.

The appropriation by Congress in 1917 of \$75,000 for TB eradication began federal funding of the program, which has continued the rest of the century.

In 1921, the TB committee report included Uniform Methods and Rules for TB-free accredited herds of cattle, which were approved by the BAI later that year.

Private practitioners were accredited to accelerate the initial testing needed in the nationwide program. During the first year, 3,160 veterinarians were accredited in 31 states. The term "accredited veterinarian" was first associated with the TB eradication program.

The proceedings of the 35th meeting in 1931 contain evidence that the controversy regarding this disease had accelerated. Dr. Peter Malcom, the Iowa state veterinarian, was nominated and elected president of USLSA out of the order that had been established for succession to office, as an emergency measure "to benefit the association and back up a state that has had the most trouble in the past year."

Malcom then explained the problems in Iowa, which involved TB regulations and eradication. The veterinary profession, not only in Iowa, but across the U.S., was in jeopardy, with the opposition to TB work in Iowa condemning the veterinary profession,

claiming that the work was not reliable, the tests were unreliable, that the veterinarian was doing it for his own benefit and the laws were passed for him.

Malcom said the Iowa laws had been tested in the courts, up to the Iowa Supreme Court--the U.S. Supreme Court said it had no jurisdiction--and found constitutional and justified as a public health measure. The tests were found to be reliable.

With the support of the courts, he set out to enforce the law, resorting to calling out the state militia. "We went out and tendered our services and were interfered with and we got three for contempt of court. The governor said, 'Now we must defend our court,' and we did. The result was that we went out into six counties and made the test. In one county with 2,441 cattle owners, with only 600 did we have to use force to test their cattle. Testing had to be forced in far fewer herds in four other counties. In the sixth county, no testing had been done, so all herds had to be tested with many reactors found."

An Iowa historical publication describes the "Cow War" this way:

"The 'Cow War' was sparked by officials testing cattle for bovine tuberculosis. Farmers, hard pressed by the Great Depression, found the testing and subsequent condemnation of their cattle increasingly alarming. They began massing at testing sites, hoping their presence would discourage veterinarians from proceeding with their work.

"In September 1932, two state veterinarians, backed by 65 law enforcement agents, arrived at a farm near Tipton, intent on testing the cattle. According to longtime political reporter George Mills, the 400 farmers who gathered at the farm 'were in an ugly mood.' They turned their wrath on the veterinarians' car, filling it with mud, breaking the gas line, slashing the tires and smashing the windows. The veterinarians retreated and the next day Gov. Dan Turner declared martial law in Cedar County and called out the National Guard.

"For all practical purposes, the incident at the farm ended the Cow War. The only casualty was a guardsman who accidentally shot himself in the foot."

At the annual meeting in 1936, it was reported that federal funding had been decreased to \$1.5 million. The disease, which had increased from 0.9 percent of cattle showing lesions at slaughter in 1908 to 2.3 percent in 1916, was being brought under control; the reactor rate had dropped below 1 percent for the first time since eradication efforts had begun; 96 percent of the counties in the nation were accredited virtually free.

By 1940, all states were modified accredited bovine TB areas, meaning the cattle infection rate was less than 0.5 percent.

Over the next 50 years, the TB committee continued to meet and discuss activities to erase the lingering prevalence of the disease. The success of those efforts is illustrated by

the fact that in 1974 the cattle TB reactor rate dropped to an all-time low of 0.3 percent. Ten years later it was down to 0.003 percent.

A threat that grew during those years was the continued prevalence of the disease in our neighbor to the south, and in 1991, a resolution called for creation of a task force to formulate regulations necessary to prevent transmission of TB from cattle imported from Mexico. A new problem was the incidence of the disease in farm-raised deer and elk.

That same year a resolution called for depopulation of all TB-infected cattle herds.

TB discussions and reports covered 44 pages in the proceedings of the 99th meeting, indicating the continuing interest in this disease by the organization. There were nine infected cattle herds and 10 infected herds of deer and elk in the country. Progress in eradication efforts in Mexico were reported, reducing the risk of transmission from that source. Problems continued in large dairies in the El Paso, TX, area. As the second 100 years of the organization approached, it was obvious that bovine TB will continue as an interest into its second century.

Chapter 5--Hog Cholera

In 1860, the Agricultural Division of the Patent Office reported the prevalence of hog cholera among swine in the U.S. In his history of regulatory veterinary medicine published in the proceedings of the 69th meeting, R. A. Hendershott, secretary-treasurer of USAHA, said this is believed to be the first report of the national government calling attention to the prevalence of an animal disease in this country. Just two years later, Congress established the U.S. Department of Agriculture.

A USDA publication, "U.S.A. Hog Cholera-Free 1978," a review of the eradication effort, says: "Apparently, hog cholera is a native American disease. In 1887, the U.S. Department of Agriculture tried to reconstruct the history of the origin and spread of hog cholera by surveying correspondents throughout the country. Reports received in this survey indicated the disease was first noted in southern Ohio along the Muskingum River in 1833 and in the Wabash River area of Indiana from 1830 to 1833. The name stems from a confusion created by an outbreak of Asiatic cholera in humans that coincided with the first appearances of the swine disease in Ohio." In Europe, to which the disease spread from the Americas, the disease was called swine fever.

One of the early controversies regarding the Bureau of Animal Industry (BAI), which was established in 1884, and its chief, Dr. Daniel Salmon, involved the etiology of hog cholera. This was a long and acrimonious dispute that involved Salmon personally and threatened his credibility and therefore the continued existence of the BAI, according to "100 Years of Animal Health," published by the Associates of the National Agricultural Library, Inc.

Until the viral etiology of the disease was determined by BAI employees in 1903, many claims of causation and cure were made. This controversy intensified in the early 1890's.

By 1895, hog cholera had spread throughout most of the country where hogs were raised; an Indiana distillery lost 11,000 hogs in the fall of 1896. Disposal of dead hogs had become a problem and they were being smuggled to rendering plants where the lard was used to make soap and axle grease. A brisk trade in hog carcasses had developed.

The first mention of hog cholera in the proceedings of the organization that became USAHA can be found in the report of the 4th meeting in 1900, at which a paper was presented on hog cholera control by the states.

At the 11th meeting in 1907, the president of the association, listed hog cholera as the second most important disease, behind TB and ahead of cattle tick fever.

A paper on hog cholera suggested that it was time for interstate movement controls for the disease, which to that point had been the subject of state regulation only.

A resolution at the meeting in 1908 urged states to fund hog cholera vaccine manufacturing as a result of the development two years before by Marion Dorset of the serum-virus method of immunizing hogs against hog cholera.

A report on use of this serum, which was produced under state authority, was presented at the meeting in 1910. The serum was furnished to farmers free, to be used around infected farms. The report indicated 11 states had adopted the plan and 20,000 hogs had been treated with serum during the previous year, with positive results.

The committee on swine diseases in 1911 defined hog cholera and salmonellosis, which had formerly been described as hog cholera. That same year, the organization approved a resolution calling for production and distribution of hog cholera serum, virulent blood and vaccines under the direct supervision of state authorities. During that year, the executive committee drafted recommendations to all state governors that the states take action to acquire authority to control anti-hog cholera serum labs operating within the states without a federal license. That year, a resolution urged USDA to supervise the production of all veterinary biological products and two years later, in 1913, the first veterinary license was issued for production of anti-hog cholera serum.

A hog cholera control committee had been organized by the 25th meeting in 1921. The committee reported that a wave of disease had swept the country since July of the previous year, with losses in the year ending April 30, 1921, estimated at \$33,238. Farmers were encouraged to use serum for control of the disease.

In his address to the 30th annual meeting in 1926, President J. W. Connaway asked: "Why not eradicate hog cholera?" anticipating by 35 years the start of an eradication effort.

A resolution proposed at that meeting urged USDA to enact and enforce regulations to prohibit the interstate movement of swine for purposes other than slaughter, that had not been immunized against hog cholera either by serum alone within 20 days of movement, or by simultaneous inoculation with serum and virus. Opposition to use of virus in areas where no cholera existed, which would be required for interstate movement by the proposed regulation, resulted in tabling and therefore defeating the resolution. This action illustrates two trends: (1) the role of USAHA in writing interstate regulations and program standards, which USDA later adopted in disease programs such as hog cholera, and (2) the controversy that continued to surround the hog cholera control and later eradication efforts.

Papers were presented at the 40th meeting in 1936 on crystal violet vaccine and an attenuated tissue vaccine.

The swine diseases committee reported at the 50th meeting in 1946 that a survey indicated there was less hog cholera that year than the previous year.

Reports on new hog cholera vaccines highlighted the meeting in 1951. There were reports on laboratory studies of a modified live vaccine, field trials on a commercial modified product, a commercial tissue culture modified product and a rabbit-modified product.

The hog cholera committee at that meeting said: "The committee believes eradication is possible, but not as long as mass production and field use of virulent hog cholera virus is permitted." The committee recommended that as soon as non-virulent vaccines are fully approved and demonstrated effective, renewal of licenses for production of virulent virus be stopped. This signaled the next battle in the effort against the disease--elimination of the use of virulent virus for vaccination, a battle that was to go on for several years.

At the meeting in 1956, the organization approved a resolution calling on the federal government to work with the states to develop a hog cholera eradication plan.

The hog cholera committee met between annual meetings and urged a ban on production and sale of fully virulent hog cholera virus as of Jan. 1, 1958.

In September of 1961, Congress authorized a hog cholera eradication program and, at the 65th meeting later that year, the USAHA hog cholera committee called for a crash research program to develop a rapid diagnostic test for hog cholera. The eradication program was beginning, but there was still no test for use with live hogs to determine whether or not they were infected.

It was during this period, at meetings of the hog cholera committee, that memorable debates took place between Dr. Howard Dunne of Pennsylvania and J. A. Baker of Cornell on scientific aspects of the hog cholera virus and its diagnosis. These debates continued at each meeting for several years, while the rest of those attending the committee sessions sat back and listened, understanding little, if any, of the esoteric discussion by the two scientists.

The use of virulent hog cholera virus vaccines was outlawed in 1963, ending that battle, but setting the stage for another battle later, when it came time to ban the use of the modified vaccines as final eradication was achieved.

By 1965, all states were enrolled in the four-phase eradication program and at the meeting in 1966, the committee reported that five states were free and only three states remained in the preparatory stage of the program. The first suggestions of problems with individual vaccines were voiced and vaccination was increasing as a cause of outbreaks.

At the start of the 1968 meeting, a symposium on feeding of garbage to hogs brought to the organization's annual meeting, for the first time, a new group, the garbage feeders. They became regular participants in the cholera discussions following that symposium.

Increased vaccination, with the new modified vaccines and later with much safer products, was a first step in the eradication effort. That made it even more difficult when the time came to eliminate the modified vaccines, partly because they were no longer needed, but also because they were spreading the disease. At one point it was thought that killed vaccines should replace modified live vaccines, but then it was found that the virus was not killed in some of those products and they were blamed for spread, as well.

Some producers, including the garbage feeders, were convinced they could not continue their operations without vaccination and they fought hard to keep it, aided by some practicing veterinarians, whose major income source had been cholera vaccination.

On July 1, 1969, federal action was taken to outlaw use of modified live virus vaccines and use of killed vaccines was restricted to a few states.

One of the principles of the program was that in states in advanced stages of the program all infected herds were destroyed and buried. But because of the costs involved in indemnity payments for such herds in densely populated hog states, a decision was made to relax that requirement and allow salvage by slaughter of such herds, in spite of the hazard of recycling of the virus through meat scraps in inadequately cooked garbage fed to hogs. This decision moved the program forward in several Midwest states, but may have resulted in outbreaks in some garbage-fed herds, in spite of regulations requiring cooking of garbage fed to hogs.

In its 1971 report, the committee took note of the use for the first time, of the task force approach to eradication in an outbreak in the Dismal Swamp area of Virginia and North Carolina. This involved mobilization of federal and state manpower from across the country in a concentrated effort to go down the road to find infected hog cholera herds and destroy them. This approach was used successfully several times in the final stages of the program, notably in the Carroll County, IN, area.

An outbreak of the disease in the Midwest and South in August of 1972 prompted USAHA to call a special meeting in Washington of leaders in the effort. That meeting resulted in a declaration of a hog cholera emergency by the Secretary of Agriculture on Oct. 11, 1972. The emergency declaration made additional federal funds available to eliminate the final outbreaks of the disease.

April of 1973 was the first hog cholera-free month in the country in more than 100 years.

There was one case, in Mississippi, in 1974. The disease was found in a livestock market in Texas in July of 1975 and traced to one positive herd, which was depopulated that month. In 1976, after more than seven months without a case, the disease was confirmed in New Jersey in February, followed by cases in Rhode Island, Massachusetts and New Hampshire. The source of the outbreaks in those garbage-fed New England herds was believed to be illegal vaccination. The last case in the country was diagnosed on Aug. 1,

1976, in a herd in New Jersey as a result of spread from the New England cases. This proved to be the final case in the long history of hog cholera in the nation.

Organized garbage feeders, who had fought the elimination of vaccination, became stout advocates for the program in the final years and were especially helpful in eliminating the final outbreak in New England.

In January of 1978, the secretary of agriculture declared the country free of hog cholera. Cost of the program was put at \$140 million, compared with a cost of vaccination and death losses before the eradication effort began, estimated at \$50 million per year, which was projected to double by 1977 without a program. Hog cholera had killed more swine than any other infectious disease known. The program had the distinction of costing less than the total projected in 1962 of \$160 to \$200 million.

A year-by-year summary of the eradication effort can be found in the USDA publication "U.S.A. Hog Cholera-Free 1978."

Chapter 6--Brucellosis

Contagious abortion had been a serious problem since as early as 1843, according to "100 Years of Animal Health." Some herds had a few abortions year after year, but when the disease first appeared in a herd, almost every pregnant cow would abort within one or two years. In addition to loss of the calf, the cow gave little milk and sometimes was sterile. After a Danish veterinarian, Dr. Bang, (the disease was for many years, and still is frequently referred to as Bang's disease) reported the isolation of a small organism, *Bacillus abortus* (later revised to *Bacterium abortum*, then to *Brucella abortus*), from the placenta of aborting cows, BAI attempted to confirm the finding. During the early years of the 20th century, the organism was recovered by U.S. scientists from aborting cows, from milk, from the tonsils of children and from aborted pigs.

As early as 1911, a resolution of USLSA urged distribution of information on infectious abortion of cattle. During the meeting of the organization in 1921 the committee on abortion disease endorsed recommendations of an AVMA committee, one of which involved developing a better name for this disease condition in cattle, but at the meeting five years later it was still called contagious abortion.

Knowledge about the disease in cattle, swine and humans grew during the 20's and 30's, as did the number of reported cases, both in cattle and humans. At the annual meeting in 1931, the organization had assumed its traditional role with regard to control programs for such diseases. The Bang's disease committee included recommendations on uniform methods for conducting the tube agglutination test. Recommended regulations for the interstate movement of dairy and breeding cattle were referred back to the committee for further study. The committee had adopted a procedure that was to become standard for the group--use of subcommittees on various aspects of the disease and its control.

The committee on swine diseases recommended a special committee be named to study methods of control and eradication of infectious abortion of swine, recognizing its relation to undulant fever in man. At the 1936 meeting, papers were presented on progress of Bang's eradication, area work on the disease and the attitude of breeders and dairyman. These were major discussion topics at the meeting. In 1938, more than 4,000 cases in humans were reported, many in workers in slaughter houses.

In addition to *Brucella abortus* from cows and *Brucella melitensis* from goats, a third related organism from aborted swine fetuses was named *Brucella suis*. The disease caused by all three organisms is called brucellosis. The name came from an British army surgeon, Sir David Bruce, who first isolated the organism from patients on the island of Malta. The human disease, called undulant fever and sometimes Malta fever, is caused by any of the three species of the organism.

Attempts were being made to develop a vaccine and these attempts, including some that contained living organisms capable of persistent infections in cows, were factors in

prompting the resolutions by USLSA calling for federal licensing of vaccines. In 1936, the first field trial used strain 19, a live culture of *Brucella abortus* of reduced virulence. Strain 19 was the 19th candidate culture of the organism isolated during studies by a BAI scientist, Dr. John M. Buck. It was recovered from the milk of a Jersey cow in the BAI dairy herd. The vaccine protected calves from challenge with the organism, but did not spread to other calves. Results of the field trials were so good that strain 19 became the basic control against the disease worldwide. In millions of vaccinations it has never reverted to its original virulence.

The cooperative state-federal brucellosis eradication program was launched in 1934 as a part of an emergency cattle reduction program prompted by severe drought conditions in some parts of the country. It provided for testing of herds, slaughter of reactors and for indemnity payments to the owners. In 1936, the national herd infection rate was estimated at 14 to 15 percent. By 1937 the Bang's disease committee of USLSA noted that 35 states were requiring that breeding and dairy cattle come either from Bang's-free accredited herds or be negative to a test prior to entry; 17 states had partial or complete area testing programs.

In 1937, the Bang's disease committee title included in parentheses the word "brucellosis."

A resolution at the meeting in 1941 commended BAI for development of strain 19 and the Bang's (brucellosis) committee reported 39 states had adopted plans for calfhood vaccination with strain 19. The committee recommended calfhood vaccination, but not as a substitute for other control methods, symbolizing a dispute that was to continue for many years--whether to rely solely on vaccination or to vigorously pursue eradication efforts along with vaccination. There was a full morning session at that meeting on the disease. A forum on the subject with eight experts on a panel answering questions from the audience took up 21 pages of the proceedings. Brucellosis had by now become a major effort of the organization, a situation that was to continue for nearly 50 years.

North Carolina became the first modified-certified brucellosis area (infection in less than 5 percent of herds and 1 percent of cattle) in 1941, but program progress slowed during the war, as did involvement of the organization: the report of the committee in the proceedings of the 1946 meeting was just eight lines long.

At the meeting in 1947, the brucellosis committee proposed a plan that included a B brand on reactors, testing at government expense in program areas, a V tattoo plus eartags on vaccinated cattle, and four eradication plans--test and slaughter, test and calfhood vaccination, calf vaccination without test and adult vaccination. These proposals resulted in adoption by the BAI in 1947 of the first uniform methods and rules for the eradication program.

USLSA was one of 21 farm, livestock and health groups included in a new National Brucellosis Committee formed to invigorate the program. A market cattle testing program to find infected herds was begun and alternative tests, including the ring test and complement fixation, were developed. An accelerated brucellosis eradication program began in 1954, another in a long series of attempts to revive the program. There were an estimated 124,000 infected herds nationwide.

In 1955, the secretary of agriculture set a goal of 1975 as the target date for the eradication of brucellosis.

At the meeting in 1956, the president of USLSA pointed out that while bovine brucellosis eradication was progressing at a "remarkable rate," swine brucellosis eradication was lagging in virtually all states. He noted that swine brucellosis was the cause of disease in humans to a much greater extent than the disease in cattle. A resolution adopted that year called for development of a plan for control and eradication of swine brucellosis.

The reference to swine brucellosis as a major human disease threat was to continue for several years, as the data on infections among veterinarians, slaughter house workers and livestock owners continued to implicate the infection in swine as a major source of the disease in humans. California officials in the 1960's threatened to accept shipments of slaughter hogs only from states that were free of the disease. That got the attention of Midwest states that were furnishing thousands of hogs for the California slaughter market and the swine industry became interested in swine brucellosis eradication for the first time. The California action was prompted by the high incidence of brucellosis in slaughter house workers there.

This situation--human brucellosis resulting from infected swine--prompted a revision of the program 30 years later, when an outbreak of human disease in a packing house in Virginia resulted in inauguration of whole herd depopulation to wipe out the last infected herds.

The brucellosis committee at the 1956 meeting noted that the accelerated bovine program, begun in October of 1954 with increased financial support, resulted in herd testing up 57 percent and animal testing up 87 percent. A speaker predicted that by 1960, most of the south would be brucellosis-free. The committee held open hearings three evenings and suggested extensive changes in the UM&R.

In 1961, the swine brucellosis eradication effort began, but the meeting that year illustrated the ongoing controversy in the bovine program. A day-long hearing was conducted by the committee to hear competing views, one of which was a request by western cattlemen to recertify range areas as free of the disease on the basis of calfhood vaccination alone, a proposal that was rejected by the committee.

At the 1966 meeting, the brucellosis committee was still embroiled in controversy, holding a full day of open meetings. The committee asked for a program for control of brucellosis in domestic bison herds, also that swine moving interstate be from validated free herds.

At its 1971 meeting, the brucellosis committee adopted a goal of eradication from the U.S. by Dec. 31, 1975, just four years in the future. Also, the secretary of the interior was urged to cooperate in eradication of brucellosis from bison in Yellowstone Park, a matter that continues to be of interest and is still unresolved.

That 1975 goal was not reached; in fact, at the meeting in 1976 it was reported that the disease was spreading faster than the program was cleaning up infected herds, which was blamed partly on the diversion of federal funds to other animal health programs. In response to the new crisis in the effort, a brucellosis technical commission was formed to study the program and recommend changes to reverse the trend. During that 1975 meeting, the brucellosis committee met in open session for six hours and in executive session for more than 11 hours. Technical commission members sat in on the discussions.

In September of 1978, when the technical commission reported its conclusion that "control leading to eradication is biologically feasible," there were 7,483 known infected herds in the country, but in some areas no real surveillance to find infected herds had yet begun. The technical commission report included 11 sets of findings and recommendations. While many who had doubts about the program had committed themselves to abide by the report, it prompted another series of long meetings to convince the cattle industry, primarily western cattlemen, of the need for the testing required in the program. Those discussions were still in progress during the 1981 meeting, at which Sunday afternoon sessions of the brucellosis committee were required to allow time for all those who wished to be heard. Many states had implemented the recommendations that had been made part of the revised Uniform Methods and Rules. The committee was holding midyear meetings to cope with the changing nature of the program. More than 150 attended the committee sessions at the annual meeting and the report took 45 pages in the proceedings.

At the meeting in 1986, a five-year swine brucellosis eradication plan was approved; there were only 21 new infected herds found in the country during the preceding year.

In 1990, a major milestone in the bovine program was achieved when the number of infected herds in the country dropped below 1,000, with surveillance to find infected herds in place in all states.

But as the centennial meeting of USAHA approached, final eradication has not yet been achieved, either in cattle or hogs. The number of quarantined cattle herds dropped below 100 for the nation during 1995. The goal for complete eradication from cattle of 1998

was in sight. As of March 31, 1996, there were only three known infected swine herds in the country. Depopulation of infected herds was the program of choice in both species.

Brucellosis in farmed deer and elk was a continuing problem and the situation with regard to infection in the bison and elk herds in Yellowstone Park had not yet been resolved.

Chapter 7--Poultry Diseases

This chapter is a synopsis of the avian health endeavors of the United States Animal Health Association since it was founded in 1897, with a central focus being the history of the Committee of Transmissible Diseases of Poultry and Other Avian Species. Other USAHA committees have contributed significantly to avian health issues over the years. The objective is to convey to the reader a flavor of USAHA concerns, activities, resolutions and recommendations in avian health and a representation of some of the major avian health issues addressed over the years.

The proceedings of the annual meetings of the USAHA, and especially the annual reports of the committee, provide a chronology of the deliberations and actions of the nation in regard to the conservation of the health of its avian species.

The Pre-Avian Years: 1897-1923

Dr. Dinnwiddie of Arkansas was the first person identified in the organization's proceedings to have referred to an avian disease in remarks during the eighth annual meeting in 1904. His reference to "chicken-cholera" was made as an aside during a sometimes heated discussion about the etiology of "haemorrhagic septicaemia" of cattle. He discussed the differences in animal species susceptibility to inoculation of morphologically similar bacilli isolated from cases of "haemorrhagic septicaemia" in cattle, "swine-plague" and "chicken-cholera." A Dr. Wallace pointed out the French had named all of the diseases caused by these similar and related bacilli "pasteurolosis" as a compliment to Dr. Pasteur.

There was no further mention of avian species or avian diseases until 1920. During the 13th annual meeting in 1909, the Committee on Sanitary Laws and Regulations reported on a survey of states for "copies of all existing laws, regulations and proclamations related to live stock sanitary affairs." Forty-four states responded and detailed numerous controls for mammalian diseases, but none pertaining to avian diseases. Similarly, during the 14th annual meeting in 1910, 14 state veterinarians summarized the health status of live stock in their states and made no reference to avian species or avian diseases.

The first avian disease to be referred to on its own merits was a nutritional disease of poultry of unknown etiology investigated by Drs. Harding and Beach at the University of California. This was part of a summary of animal health issues during the 24th annual meeting.

Avian tuberculosis was also noted during the 1920 meeting and concern was expressed about its spread and economic importance. The need for USLSA to address diseases of poultry was acknowledged: "It is quite within the province of live stock sanitation that the diseases of the feathered tribes should receive more consideration from veterinarians and sanitary authorities than they have in the past or do at the present time. The losses

from diseases among poultry are greater, in proportion to the investment, than they are with any other group of food producing animals."

The next reference to avian species was in 1921, when J. R. Beach, California, presented the first USLSA general session paper on avian disease, entitled "Nutritional Diseases of Poultry." No further mention is made of poultry until 1924.

The Founding of the Committee and Its Four Names

In 1924, at the 28th annual meeting, the Committee on Diseases of Poultry was formed and L. Van Es, Nebraska, was named the first chairman.

The committee gave its first report in 1925 under the revised name of the Committee on Poultry Diseases. In 1930, the name changed to the Committee on Transmissible Diseases of Poultry and, in 1981, it became the Committee on Transmissible Diseases of Poultry and Other Avian Species.

The Mission and Purpose of the Committee

From its inception, the committee has remained the primary forum for discussion of avian issues and constituencies within USAHA. It has chosen not to break up into separate commodity committees, or into specific avian disease committees, as has been the case with mammalian commodities and subjects. Rather, with some exceptions, it has generally retained all of the avian species and issues "under its wing," so to speak.

In terms of mission and purpose, the committee's first report in 1925 stated that, in regard to poultry health, USLSA should confine itself to bringing about the organization of agencies of control, rather than to the details of methods and measures to be taken. Agencies recognized as important to the improvement of poultry health were the USDA's Bureau of Animal Industry, state animal health agencies, educational agencies, colleges of veterinary medicine and agriculture experiment stations.

In 1991, the committee defined its purpose as providing information and advice to USAHA on issues pertaining to the health of animals of the avian species and the hygiene of raw foods of animal origin. It served as a forum for private and public sector individuals and organizations to: (1) study the science of the health of animals of the avian species and the hygiene of raw foods of avian origin and convey, through comprehensive committee reports, pertinent information regarding current issues in these areas; and (2) advise, through recommendations and resolutions, means to unify laws, regulations, policies and methods pertaining to prevention, control and eradication of transmissible avian diseases and the hygiene of raw foods of avian origin. The principal agencies to which committee recommendations and resolutions would be directed are federal and state agencies, academic institutions, avian industries and allied industries.

The First Meeting of the Committee

In the first report of the committee in 1925, Chairman Van Es remarked that the annual output of poultry and poultry products amounted to approximately \$1.25 billion, while the total poultry interest was about double that. He said fowl-pox, canker, croup and particularly fatal bronchitis had inflicted heavy losses; that fowl-cholera, fowl-typhoid, as well as coccidiosis were extracting a heavy toll; that in large areas of the country blackhead had well nigh suppressed the raising of turkeys; that bacillary white diarrhea had become a marked incubus on hatcheries and chick enterprises; that tuberculosis among barnyard fowl had become a serious concern and that the menace of European fowl plague was but narrowly averted.

He said poultry interests should be given the same degree of sanitary protection enjoyed by other live stock industries and proposed the term "live stock" and "domestic animal" as they appear in laws and regulations be interpreted to include all types of poultry. He urged USLSA to unite with the National Poultry Congress in the promotion of control measures pertaining to poultry diseases.

He urged USDA to supervise interstate movement of poultry, to study the possibility of supervision over poultry slaughter in a manner comparable to that followed by its meat inspection service, to execute quarantine measures on importations of poultry and poultry products and to initiate measures against any exotic disease. He urged state animal health agencies to formulate ways and means to control poultry diseases, to promote legislation relative to these diseases, to publish statistics relative to poultry diseases and establish agencies for laboratory diagnosis and official health accreditation of poultry flocks. Educational agencies were urged to disseminate information and training on poultry hygiene and colleges of veterinary medicine were urged to include poultry diseases in their curricula. Agriculture experiment stations were urged to concentrate on fundamental studies to increase knowledge on poultry diseases.

The first resolution formulated by the Committee on Poultry Diseases summarized the recommendations expressed by Van Es. The constitution committee recommended a change in the USLSA constitution so the word 'livestock' would be understood to include poultry.

Committee Demographics and Work Product

From the original seven founders in 1924, the committee grew to 74 members in 1993 and is at 68 members in 1996. Mandatory federal inspection of poultry commenced in 1959 and was substantially revised in 1968. Increased condemnation of poultry from respiratory and neoplastic disease was a major avian health issue during this period and the subject of increased and intense research activity throughout the country. These factors, plus the rapid and unrelenting expansion of the highly competitive poultry industry to supply domestic and foreign demand and the incursion of exotic poultry

diseases into the U.S., have contributed to the increased interest in the activities of the committee and its size.

Since 1925, the committee has sponsored 66 resolutions. Because the committee undertakes to serve as a forum for all the avian species, the range of problems and issues it has addressed is both numerous and diverse. More than 30 specific diseases or disease categories and numerous other health related issues have been addressed.

Nine disease subjects and two general avian health issues were selected for inclusion in this chapter as representative of the contributions of USAHA in avian health endeavors. Each is presented in a chronology that includes the subject matter of general session papers presented at annual meetings, committee discussion and committee recommendations and resolutions.

The Value of USAHA to Avian Health

A review of the published annual proceedings since 1897 provides insight into the value of USAHA to avian health and why it has lasted for 100 years. USAHA is a unique, long-lived, on-going, stable, science-based, problem-solving national forum. Successive generations of individuals from the private and public sectors, representing themselves, organizations and agencies, have gathered together at least annually to discuss avian health problems of common concern, to develop a national consensus and readiness on the requirements for their control.

The history of control of pullorum disease and fowl typhoid is a classic example of a long-term, multi-generational, avian health problem that USAHA has been concerned with since 1925. USAHA's role has changed over the years from developing standards for testing and encouraging coordinated control efforts, to critical oversight of the efficacy and shortcomings of the pullorum/typhoid control program of the National Poultry Improvement Plan and finally to encouraging state by state eradication of the disease and recognition of states participating.

Pullorum Disease (Bacillary White Diarrhea) and Fowl Typhoid

Salmonella pullorum, the cause of pullorum disease (PD), was discovered in 1900 by L. F. Rettger. He coined the name bacillary white diarrhea.

At the first meeting of the committee in 1925, Van Es stated that "bacillary white diarrhea has become a marked incubus on hatcheries and chick enterprises," thus establishing a committee goal for eradication. A paper was presented on studies of the transmission of PD in incubators.

In his opening remarks at the 1926 annual meeting, President J. R. Mohler stated that "no other disease problem is of greater moment than bacillary white diarrhea. He called for

the development of a standardized test and for a better unified organization of state agencies cooperating in the plan to control the disease."

In 1926, the committee noted the central role of egg transmission in the dissemination of PD and made extensive recommendations for achieving a standardized test, including sections on antigen preparation, handling of blood samples, the testing procedure, interpretation of test results, flock application and evaluation. A paper on the control of PD noted that fowl typhoid (FT) causes cross reactions to the PD agglutination test.

Two papers on PD were presented at the 1927 meeting. At the request of USDA and the president of USLSA, the committee made six recommendations to the Committee on Unification of Laws and Regulations pertaining to the use of the word "accredited" in poultry-breeding plans. The recommendations stated the word "accredited" should only be used to indicate freedom from a specified disease, such as "Accredited Bacillary White Diarrhea Free" and that official accreditation of flocks be done by state live stock sanitary boards or similar state organizations. The committee recommended that control of PD should be voluntary, but that some agency of accreditation and uniformity of regulations were essential.

By 1928, 23 states had adopted the recommendations of the committee on use of the word "accredited" in relation to disease control only; 24 states were actively engaged in PD control, one state for 15 years.

In 1929, the committee stated that L.F. Rettger's 1928 recommendation, to use the name "pullorum disease" as a substitute for bacillary white diarrhea had been adopted by other organizations and recommended USLSA go on record favoring it. Committee recommendations for standardization of methods to control PD had been widely accepted.

A special committee was formed in 1934 to comment on the proposed USDA National Poultry Improvement Plan (NPIP), specifically those provisions pertaining to PD control. It made recommendations on the official test for PD, the new terminology of pullorum-tested and pullorum-free and supported the goal of eradication. The program was approved by USLSA with modifications.

In 1935, the committee stated that FT can be automatically eliminated as part of the PD program, as it will eliminate FT carriers. The committee urged general adoption of NPIP.

In 1937, the committee called on the BAI to place a person trained in disease control and eradication in charge of the NPIP PD/FT program and that all official testing under NPIP be performed by trained veterinarians or trained laboratory technicians. Also that year, the committee recommended that the NPIP classification "pullorum tested" (less than 10% reactors) should not be recognized, as it is contrary to sanitary control of disease to give recognition to an infected flock, and that eggs from a tested flock should not be

allowed to be used on a premises where pullorum passed and pullorum clean eggs are used. In 1938, the lack of knowledge of the efficacy of serologic testing of turkeys for PD and the nature of the disease in turkeys was noted.

Throughout the 1940's and 1950's, the committee continued to examine the progress of PD and FT control in the U.S. and to make recommendations for improvements. It urged eradication of PD for turkeys and discussed non specific reactions in maturing pullets. It noted, in 1942, that 96 percent of the birds participating in the NPIP, which in those days was primarily a breed improvement plan, were tested for PD and gave recognition for the pioneering work on PD control done in Massachusetts and Connecticut that predated NPIP by many years. It stated that much of the PD testing under the NPIP is really of the nature of a sham battle and that the problem was one of implementation rather than the plan itself.

In 1948, the committee discussed the problem of pullorum variants in PD control and in 1949, the NPIP pullorum-tested classification was dropped. In 1955, the committee stated that PD is no longer the problem it once was, that complete eradication is possible and that FT eradication is even more encouraging than PD. A review of state laws and regulations, in 1957, indicated that positive action had been taken by some to develop PD eradication plans.

The 1960's and 1970's saw the committee focused on stimulating the development and implementation of a national plan for PD/FT eradication and transfer of NPIP administration from USDA-ARS to USDA-APHIS (then the Animal Health Division). In 1961, the committee published proposed uniform methods and rules for control and eradication of PT. That same year, it urged that PD and FT be reportable diseases and created a subcommittee to work with ARS in planning its poultry disease activities. In 1964, a subcommittee formed for the eradication of PD/FT met with an NPIP committee and the eradication committee of the American Association of Avian Pathologists (AAAP). The committee endorsed a five-phase model program for PD/FT eradication and commended NPIP for changes incorporating recommendations of the USLSA's uniform rules and methods for eradication. A resolution in 1967 asked the Secretary of Agriculture to provide official recognition of the committee's five-phase program. In 1969, National Turkey Federation (NTF) efforts to develop a five-phase PD/FT eradication program were reported, but in 1970, the NTF defeated a motion for its approval, primarily because APHIS would administer the program. APHIS said it would work with individual states and Minnesota requested the program.

In 1972, the National Turkey Improvement Plan (NTIP) accepted the newly developed APHIS standard procedures for eradicating PD/FT and recognition of states participating, which USAHA and AAAP had been instrumental in developing. It was noted that four states had been declared free. The committee said USDA had been derelict in not delegating this authority to a single service within the department and recommended that

all poultry health programs be assigned to APHIS, also that USDA should provide the Northeastern states with a PD/FT eradication program for chickens.

A subcommittee on national health programs recommended support of the NPIP position favoring a more formal relationship between NPIP and APHIS. In 1976, the subcommittee reported NPIP delegates had defeated a proposal for ARS and APHIS to share responsibility for NPIP in the future. The committee noted that further pursuit of NPIP as the potential industry input into APHIS did not appear productive, that alternative means should be pursued and that APHIS will continue to recognize states participating in PD/FT eradication programs. In 1981, USDA placed NPIP under APHIS administration.

In the 1980's and 1990's the committee continued to urge states to qualify for US pullorum-typhoid clean status; expressed concern about FT outbreaks; urged states to promulgate regulations to eliminate FT infection when it occurs and prevent introduction of virulent strains of *S. gallinarum*; urged that FT be designated as a foreign animal disease; develop a program to salvage critical genetic stock when infected with FT; encourage western states to qualify for PD/FT clean status and, in the face of an increase in PD outbreaks, urged APHIS to assume a leadership role in eradication of PD outbreaks; also that USDA/NPIP require reestablishment of state pullorum status following PD outbreaks and determine the adequacy of NPIP policies.

Avian Tuberculosis

The 1920 proceedings of the annual meeting of USLSA contained a brief discussion of avian tuberculosis (ATB), which said "Our attention has been called to the large amount and widespread distribution of ATB. Either this disease is being recognized by practitioners more frequently than heretofore, or it is being carried to new territory and is spreading rapidly . . . From the work that has been done on this disease the inference seems to be justified that the direct transmission of tuberculosis (TB) from human or bovine species to poultry and vice versa is not at all likely . . . Although the avian type of tuberculosis appears to be distinct from other types, we cannot be too positive that it does not stand in an important relation to other forms."

In 1924, Van Es gave the first paper on ATB and discussed the part it played in the increase in swine TB. His findings reveal that contact with ATB is responsible for a large portion of the cases of swine TB subject to retention at packing establishments. In 1926, a paper was presented on ATB eradication from the standpoint of public disease control and proposed methods and rules for the establishment of TB free flocks of poultry. The committee mentioned that organized ATB programs were underway in several states and the BAI was cautiously proceeding with survey work.

In 1927, there were four papers on ATB, two discussing means of eradication, one on ATB studies and one pertaining to tuberculin testing of poultry flocks in Nebraska. In

1928, a survey of midwest farm flocks for ATB revealed, in one state, a tuberculin reactor rate of 4.03%. Prevalence of infection in old fowls as compared to pullets justified the recommendation to dispose of hens after the first laying season.

From 1928 to 1942, papers discussed the significance of ATB, its relationship to swine TB and field control and eradication efforts. In 1943, the committee stated that ATB was still present in the Midwest and responsible for a great deal of retention and condemnation of pork. The committee urged eradication of ATB.

Additional papers on ATB appeared from 1944 to 1949. In 1966, the committee emphasized the importance of ATB and endorsed a four-phase program and uniform rules and methods for its eradication. This was the last mention of ATB; however, during the 1970's papers on ATB were presented by the USAHA tuberculosis committee, primarily dealing with its relationship to swine TB.

Inspection of Poultry Meats and Products

In 1929, R. C. Potts discussed the commercial and economic aspects of the inspection of dressed poultry by government agencies. The USDA Bureau of Agricultural Economics had established a system of voluntary inspection of poultry products in 1928 and USLSA had repeatedly gone on record in favor of government inspection of poultry.

In 1937, a paper noted that poultry inspection started in 1928 at the request of packers of canned poultry to meet New York City health requirements, which prohibited the sale of eviscerated poultry unless it had been inspected.

A special committee on poultry and rabbit meat inspection formed in 1937 recommended the next year that USLSA formulate a plan for the extension of inspection to cover poultry products and rabbits for meat, to include ante-mortem and postmortem inspection. In 1939, the special committee noted there was a division of dressed poultry inspection in the USDA Bureau of Economics with 37 veterinarians and 10 trained lay inspectors. It said experiments in quick freezing in 1934 were followed by experiments in complete dressing of poultry, which allowed for the inspection of the viscera for the first time. USLSA, in a 1939 resolution, urged adoption of legislation for BAI to offer ante-mortem and postmortem inspection of poultry at the time of slaughter comparable to inspection of other food producing animals and that it be limited to poultry products, other than eggs, entering interstate commerce and to poultry processing establishments that make application for such inspection.

In 1950, papers discussed the USDA grading and inspection system and objections of public health authorities to the relaxation of federal poultry grading and inspection regulations. The Committee on Meat and Milk Hygiene requested a prohibition on grade labeling of ready-to-cook poultry without inspection by qualified inspectors who are civil servants and, therefore, responsible primarily to the consumer.

In 1951, there were three papers on poultry inspection. In 1953, a paper on poultry hygiene and inspection presented by a representative of the U.S. Public Health Service (PHS) discussed PHS plans to develop an ordinance on poultry sanitation and ante/postmortem inspection of poultry. Approximately 15-20% of processed poultry was being inspected by the voluntary, two-phase USDA program of sanitation and inspection.

In 1956, a resolution urged Congress to place the administration of compulsory inspection of poultry in the Meat Inspection Branch of the USDA. In 1957, the committee said: "Passage of the Poultry Products Inspection Act in August, 1957, is a milestone in our continuing efforts to provide wholesome meat and meat products to our population." The law became effective in January, 1959, applying to plants involved in interstate shipment of dressed fowl.

In 1959, the committee reported serious losses to the industry through condemnations upon the start of mandatory federal poultry meat inspection. Much of the loss was due to infections of the respiratory tract. Causes of many of these diseases were well established, meaning a concentrated educational program and dissemination of information would improve the situation.

In 1960, the inspection act of 1959 was being administered by the Poultry Division, Agriculture Marketing Service, USDA. All processed poultry and poultry products intended for interstate or foreign shipment were required to be inspected, with 821 plants operating under federal inspection. During the first year, 4.75 billion pounds of poultry were inspected and certified as wholesome. In frying chickens, the principal causes of condemnation were septicemia, tumors, parasites and decomposition. The Committee on Public Health recommended that each state and territory adopt mandatory poultry inspection regulations, using the federal program as a model.

In 1965, the Committee on Meat and Milk Hygiene began revision of the model meat and poultry inspection law prepared by the Meat Inspection Division, USDA through eight subcommittees. In 1968, the Committee on Meat, Poultry and Milk Hygiene (note that poultry was added to the committee name) had extensive discussions of the Wholesome Meat Inspection Act of 1967 and the Wholesome Poultry Products Inspection Act of 1968. Also in 1968, the poultry committee said the avian leukosis complex, particularly Marek's disease, had increased to the point where it was a devastating problem. The condemnation rate for the leukosis complex began rising dramatically in 1963, from 10 per 10,000 to 150 per 10,000 carcasses.

In 1987, the committee added microbiologic contamination of raw poultry meat and eggs as an annual discussion subject area. The committee noted National Research Council (NRC) reports in 1985 and 1987 focused attention on salmonella, campylobacter and listeria contamination. A network TV "60 Minutes" program increased consumer awareness of the salmonella issue. The committee cited USDA Food Safety Inspection Service (FSIS) pursuit of changes in the inspection program that would assure consumers

that the poultry they purchase is not only organoleptically sound, but also microbiologically and chemically safe to eat. It stated FSIS concerns will extend into farm production to control the microbiological quality of poultry offered for slaughter.

Also in 1987, USAHA recommended that USDA and FDA form an interagency task force on salmonella and food-borne diseases to reduce salmonella and other microbial agents contaminating animal and poultry products and form an industry-state advisory group to advise the task force.

In 1994, the committee discussed pre-harvest food safety and federal pathogen reduction programs, concerns about turkey osteomyelitis condemnations and formed a new subcommittee on food safety.

The committee joined four other committees in urging USAHA and FSIS to establish a working group to address the issues of pre-and post-harvest food safety and other food safety issues. The USAHA Working Group on Animal Production Food Safety was formed and held its first meeting in 1995.

In 1996, USDA-FSIS will issue the final rule on pathogen reduction, hazard analysis and critical control point (HACCP) systems, a major revision of federal meat and poultry inspection.

Salmonella Other Than *S. pullorum* and *S. gallinarum*

Salmonella, other than *S. pullorum* or *S. gallinarum*, was first discussed in a 1932 paper on paratyphoid infection in turkeys by L. F. Rettger. In 1935, the committee stated that paratyphoid in turkeys, caused by *S. typhimurium*, was assuming more importance and was causing disease in a wide variety of animals and food poisoning in man. In 1935 there were 35 or 36 biologically different types of paratyphoid organisms.

In 1939, the committee discussed paratyphoid infections in the avian species and noted that *S. enteritidis* infections had been reported in geese in Europe, but were rare in the U.S., probably accounting for the rarity of enteritidis food poisoning in man in the U.S. New studies demonstrated that birds must be considered an important natural reservoir of paratyphoid and that the majority of avian paratyphoid strains occur also in association with gastroenteritis disturbances in man.

In 1940, the committee said selective enrichment media was necessary for successful isolation of salmonella from the intestine of chickens and in 1943, a paper was given on the use of the agglutination test in detecting *S. typhimurium* carriers in turkey flocks. The committee noted in 1947 recent literature incriminating several salmonella species, including poultry pathogens, in outbreaks of food poisoning in man. In 1949, an examination of 1,014 eviscerated, normal chickens at random in one plant found 4.4% yielded one or more salmonella types.

In 1953, the committee called paratyphoid and paracolony primarily problems in turkey flocks, but increased incidence in chickens was reported. Proposals were made on means to institute state programs to eliminate these diseases and the importance of rodent control was noted. In 1958, six states had official *S. typhimurium* testing programs for turkeys. Four hundred serotypes of salmonella had been identified and about 100 had been isolated from the avian species in the U.S.

The role of feed in the dissemination of salmonella was discussed in 1959. In 1960, the committee stated the presence of salmonella in feed could well introduce a new problem of public health significance and recommended that feed contamination be thoroughly scrutinized by USDA. In 1961, ARS reported a survey revealed 718 of 5,712 samples of animal by-products yielded salmonella. Recontamination and rodents were the major source of contamination.

In 1964 and '65, the committee called for appointment of a new USLSA committee concerned with all aspects of the salmonella problem, citing public health concern about the relationship between human salmonellosis and animal food sources and reports of salmonella-contaminated animal feed and environment as a source of infection in animals. The Committee on Salmonella was formed in 1965, with T. J. Grennan, Jr., Rhode Island, as chair.

The first report of that committee in 1966 proposed a state-federal cooperative salmonella program for inspection and product testing in rendering plants. The program was initiated in 1967 and the committee proposed a model state law to regulate inedible rendering establishments. In 1970, the committee said the goal of the program was to eliminate salmonella in feed ingredients and endorsed an NRC report on the problem.

In 1972, USDA pulled out of the salmonella program because of lack of funds. USAHA expressed grave concern and advised the Secretary of Agriculture to reinstate the \$300,000 of authorized funds to support the program or, as an alternative, a similar program be instituted by the Food and Drug Administration. Uniform methods and rules for the elimination of salmonella in animal by-products intended for use in animal feeds were published by USAHA.

In 1974, a progress report of a long-term cooperative state-federal-industry-university epidemiology study of turkey salmonella was presented to the salmonella committee and USDA indicated it would be reducing its participation. A summary of the project was presented in 1975.

A national salmonellosis seminar, in January, 1978, was sponsored by USAHA and cosponsored by USDA, FDA, CDC, the Office of Surgeon General and AVMA. There were 250 registrants and 3,000 copies of the proceedings were published. The USDA planned benchmark studies on feed, poultry and livestock entering slaughtering facilities

and meat leaving the plant. USDA allocated \$360,000 for feasibility studies of salmonella control in breeder/poultry flocks.

The role of native, intestinal micro flora in protection against pathogens and the status of salmonella in dressed poultry and pork products was discussed in papers presented in 1979. In 1982, the report of USDA feasibility studies of salmonella control in breeder/poultry flocks stated it was not economically feasible to grow chickens free of salmonella and competitive exclusion may be useful, along with vaccines.

In 1985, the Animal Protein Producers Industry (APPI) reported that the first project of its salmonella committee would be to determine the current level of salmonella recontamination in animal proteins. A USAHA resolution in 1986 called on FDA and USDA to increase funding for reduction of salmonella in animals, meat and poultry products and recontamination in rendering plants.

The committee in 1987 discussed an FSIS study of improved inspection, the increase of *S. enteritidis* (SE) in humans in the Northeast (1976-1985) and a historical review of campylobacter. Papers were presented on salmonella control and the feasibility of salmonella control in the poultry raw meat industry. In 1988, an ad hoc committee on SE was appointed to recommend how USAHA could involve itself in the SE issue. This committee recommended a seminar on SE, which was held during the 1989 annual meeting. Recommendations called for USDA to develop a contingency plan for eradication of SE Phage Type IV if introduced; USAHA to develop a SE task force in cooperation with USDA, USHHS, state agencies and the poultry industry to develop a control program for SE infection in the egg industry, and USDA and USHHS to fund biosecurity education. USAHA opposed premature mandatory SE testing of chickens until development of a scientific knowledge base.

Also in 1988, a resolution supported efforts to detect stock capable of producing eggs contaminated internally with SE and offered a voluntary model state program for SE quality assurance for consideration. A USAHA SE task force reported its findings in 1990.

In 1990, the Center for Veterinary Medicine (CVM) of FDA announced a goal of salmonella-free animal feed and feed ingredients and in 1991 CVM asked USAHA to serve as a national forum for scientific debate on the means to eliminate salmonella from the feed of food-producing animals. An ad hoc committee to study this proposal was named and in 1992, a new Committee on Feed Safety was formed with M. S. Cover chair. Its meetings have been a focus of broad industry, regulatory and academic interest and discussion.

In 1991, the salmonella committee published Salmonella Risk Reduction, Integrated Guidelines for Table Egg Production and, in 1993, published Best Management Practices

for Salmonella Risk Reduction for Chickens and Best Management Practices for Salmonella Risk Reduction for Turkeys.

In 1993, a resolution called on USAHA to reactivate the USAHA SE task force. The new SE task force submitted a report in March, 1996, to the board of directors.

In 1996, FSIS will issue the final rule on pathogen reduction and hazard analysis and critical control point (HACCP) systems, a major revision of federal meat and poultry inspection.

Avian Influenza

The first reference to avian influenza (AI) in the proceedings is found in USLSA President McNeil's opening address at the 29th annual meeting in 1925. He said: "During the past year, the representatives of the Federal Bureau and several states have effectively dealt with two outbreaks of foot and mouth disease and we believe suppressed European fowl pest brought into this country by laboratory workers and accidentally introduced into the flocks in the United States, causing extensive losses to poultry and allied industries until finally brought under control.

"A close check on car lots and express consignments of poultry arriving at the eastern railroad terminals during December, 1924, and January, 1925, demonstrated that a large number of diseased birds were arriving and it was necessary to institute a systematic inspection for the live poultry industry of the east." McNeil noted that 10,000 rail cars of mixed, live poultry, representing some 40 million birds are received at the railroad terminals of Newark, Jersey City and Elizabeth. This emphasized the problem of live poultry markets in the control of avian influenza. Live bird markets, on a smaller scale, would again prove to be a major issue in the control of the disease in the 1980's and 1990's.

Four years later, in 1929, the second outbreak of AI was noted by the committee

Twenty-two years later, in 1951, H. J. Stafseth discussed his observations of a fowl pest outbreak in Michigan, apparently in 1924, and his subsequent laboratory studies with the outbreak virus over a three-month period and ultimate decision to destroy the virus by autoclaving.

The next reference to AI came in 1964, in a presentation by R. A. Bankowski, describing an apparently new respiratory disease of turkeys, which was the first isolation of a less-pathogenic strain of AI virus in the U.S. In 1967, the committee alerted the poultry industry to the appearance of the new AI viruses of relatively low pathogenicity, but potential danger. In 1972, the committee noted reports of more frequent occurrences of the fowl plague related AI viruses and recommended all diagnostic laboratories be alerted. An AI subcommittee was formed.

From 1973 to 1975, the AI subcommittee noted an increasing awareness of turkey AI outbreaks, the isolation of AI virus from free-flying water fowl and recommended USDA and NIH establish protocols for the import of exotic AI viruses and infected materials and laboratory security.

In 1976, the AI subcommittee reported AI had been diagnosed in chickens in Pennsylvania, the first diagnosis in chickens since 1929, when fowl plague was eradicated from the U.S. A paper on the isolation and identification of the virus was also given that year. The following year, the subcommittee discussed contingency plans for an AI outbreak and in 1978 a paper on vaccination of chickens against AI was presented.

In 1979, amid reports of AI infection in turkeys in the north central states, California and Texas, the committee suggested an international symposium on avian influenza, to be held in the U.S. and to develop guidelines to the classification of highly virulent strains and their control. A paper was presented that year on the prevention and control of AI in turkeys.

Recommendations from the 1981 symposium covered: (1) uniform identification and terminology; (2) uniform import/export requirements, including the concept of regionalization; (3) methods for prevention and control; and (4) research priorities.

The subcommittee reported AI infection in 11 states in 1981, with one isolation from chickens, and recommended that USDA implement recommendations of the symposium, develop a bank of AI isolates for vaccine production and standards for AI vaccine and that all AI isolates be sent to NVSL.

The 1983 committee report stated AI (H5N2) had been diagnosed in at least 38 chicken flocks and 2 chicken flocks in Maryland and that inactivated AI vaccines were used in four states in 160 turkey flocks.

The committee reported in 1984 that AI (H5N2) in Pennsylvania, Virginia, Maryland and New Jersey in egg-type chickens, broilers and turkeys was the most expensive and costly outbreak of an infectious disease in the history of the poultry industry in the U.S. A state-federal-industry eradication program was in progress.

In 1984, the committee proposed sponsorship of a second international symposium; urged states to make AI a reportable disease and urged USDA to support laboratory facilities and personnel studying the epidemiology of AI. Five papers on AI were presented covering: (1) problems associated with eradication; (2) task force depopulation concerns; (3) description of the 1983-84 outbreak; and (4) molecular characterization of the 1983 Pennsylvania virus.

At the 1985 meeting, the committee reported that, on May 29, 1985, USDA declared lethal AI (H5N2) eradicated from the U.S. at a total cost of \$65 million. Producers

suffered \$55 million dollars in direct loss, of which \$44 million was offset by indemnity payments. Consumers paid \$349 million more for protein food. Without eradication, producers would have suffered \$508 million in losses and consumers \$5.6 billion in increased cost of protein food. Several states reported AI in turkeys and the Delmarva Poultry Industry developed a procedure manual on emergency poultry diseases.

An AI reevaluation and nomenclature subcommittee was appointed in 1986 to review alternatives and recommend appropriate definitions of AI which would permit control and eradication and action to allow unhindered trade between countries. AI infection in chickens, turkeys and game birds, associated with the live bird markets in eastern states, was described and a report presented on the second symposium in 1986.

In 1987, the nomenclature subcommittee presented its recommendations on terminology and on criteria for when an AI isolate causing an outbreak should be considered for eradication. The Third International Symposium was held in 1992. From 1993 to 1995, the committee discussed AI outbreaks in Mexico, the development of a recombinant AI/fowl pox vaccine and planning for a fourth international symposium on AI in 1997.

Newcastle Disease

The first mention of Newcastle disease (ND) in the proceedings was a 1942 paper on avian pneumoencephalitis by J. R. Beach. In 1944, the disease was shown to be caused by the virus of Newcastle disease, the first identification of a ND virus isolate in the U.S. A paper on vaccination for pneumoencephalitis followed in 1944 and the committee recommended that suspected cases of the disease be reported to the BAI.

In 1945, the committee remarked on the spread of ND to the eastern shores of the U.S. and urged all to become familiar with this new enemy. The committee said most important would be to learn the distribution of the agent and urged a nationwide survey, outlined directions for diagnostic procedures, and warned of the many ways the disease could be spread.

There were four papers on ND in 1946 and the committee reported a national committee on ND, made up of state, federal, industry and research representatives, had been formed. The USLSA committee recommended that the combined recommendations of BAI and the national committee on ND be implemented on a state basis. In 1947, the committee noted that ND had been diagnosed in 43 states and the threat of ND, together with an increasing appreciation of the value of research, had greatly advanced investigation of poultry diseases during the post war-period. The committee deferred to an AVMA committee on nomenclature the best name to apply to ND.

Papers at annual meetings the next few years discussed live virus ND vaccination, internasal vaccination, day-old chick vaccination and other means of control. Research workers and commercial firms were cautioned not to release vaccines unless they first

were shown to be effective. ND remained primarily a problem of chickens, occasionally of turkeys. Mixed infections with infectious bronchitis virus were described.

In 1955, the committee said the annual cost of ND and other respiratory problems was estimated at \$40 million, with ND still the number one problem, but with a declining incidence. Milder vaccines and mass application methods (spray, water and dust) were used. The committee reported in 1957 that ND seemed well under control with vaccination and that widespread vaccination for infectious bronchitis no doubt was part of the reason. The committee discussed vaccination breaks, vaccination in general, the use of killed vaccines and a continued review of the literature on ND during subsequent meetings.

The committee expressed concern in 1971 that recent outbreaks of VVND in the U.S. could cause devastating losses and endorsed recommendations by a group of scientists calling for VVND eradication and steps to minimize the risk of reintroduction. USDA was urged to initiate immediate quarantine measures.

Also at the 1971 meeting, E. E. Grass presented a paper on the ND situation in the U.S., which turned out to be a remarkably accurate prognostication of what lay ahead. He said, "Four and possibly five outbreaks of ND in the past year caused by a viscerotropic, velogenic ND virus (VVND) should at least give us some pause to review our vaccination recommendations, at least in some areas of the country. In fact, it may be time to review our whole approach to the ND problem in the U.S. Practices in vogue in the poultry industry are conducive to a wide spread of virulent strains of virus. While the reported outbreaks of ND remained fairly well contained, this does not mean the next outbreak may not become widespread."

Shortly after the 1971 USAHA meeting, VVND was diagnosed in commercial poultry in southern California, apparently introduced by spread from imported caged birds. It rapidly became widespread. A national emergency was declared by the Secretary of Agriculture and a major state/federal/industry eradication program implemented.

From 1972 to 1973, several papers on VVND were presented at the annual meeting. The committee discussed the progress of the eradication effort and commended USDA and the State of California for their efforts. The committee made recommendations pertaining to USDA quarantine facilities, quarantine of pet bird, sentinel birds during quarantine, prompt reporting of exotic diseases to states and modification of USDA regulations to include interstate movement of poultry.

The VVND eradication task force headquarters in Riverside, CA., closed July 3, 1974, and the emergency ended after an expenditure of \$56 million in the eradication effort. USDA surveillance revealed VVND in backyard poultry flocks in Texas and pet bird import quarantine stations reported VVND infection. The committee urged USDA to

adequately fund the quarantine stations. Pet bird importation and smuggling continued as sources of VVND infection and remain a major concern in 1996.

In the late 1970's, the committee appointed a subcommittee to develop the concept of a VVND negative flock certification program that would allow hatching eggs produced by certified VVND negative primary breeder flocks and premises to be shipped out of a VVND quarantine zone. Certification plans for turkey and chicken primary breeding flocks were approved and USDA was urged to implement them. A 1978 USDA position paper supported the idea and the 1984 revision of the USDA Exotic Newcastle Disease Eradication Guide incorporated the concept of VVND negative flock certification.

A subcommittee on reevaluation of Newcastle disease virus reported in 1981 the conclusion that all velogenic strains of ND virus should be prevented from entering the U.S., whether the strains are viscerotropic or not, and that the pathogenicity of an isolate can be determined only by bird inoculation. In 1983, the committee said importation of birds that harbor any ND virus that produces lethal infection in chickens and turkeys should be prohibited. All velogenic strains of ND virus should be considered exotic and eradicated and only qualified laboratories, under USDA permit, can possess or use velogenic strains.

In 1992, velogenic, neurotropic ND was diagnosed in turkeys and cormorants and the turkeys were depopulated. The committee requested that USDA notify the poultry industry of the north central states of the risks of velogenic ND.

Mycoplasma

In 1943, under the category of diseases of undetermined or complicated etiology, the committee said sinusitis in turkeys, a condition recognized for many years, was an important problem in several sections of the country. Also, J. P. Deleplane described the condition of chronic respiratory disease (CRD) in chickens. The etiology of turkey sinusitis was reviewed in 1948, and the next year a paper was given on the cultivation of the CRD virus in chick embryos.

In 1950, discussion in the committee suggested the agent of CRD and infectious sinusitis (IS) are the same, are nationwide and the symptoms are similar to Newcastle disease and infectious bronchitis.

In 1955, the committee stated that CRD often is of multiple etiology_bacteria, virus and pleuropneumonia-like organism (PPLO). Isolation of PPLO further complicates the picture. The name "Astero-coccus avis" was suggested by one researcher for the PPLO infection. IS in turkeys is a major problem and direct egg transmission has been confirmed. The committee noted that infectious synovitis (ISYN) in chickens is most likely an infectious disease and widely distributed.

In 1956, a paper on statewide testing for PPLO infection in poultry was given and the committee discussion indicated the etiology of CRD is confusing because of the number of agents involved. Various names for the disease and agent were put forward: pleuropneumonia coryza, CRD and Mycoplasma gallinarum. Progress had been made in artificial media culture of PPLO and in vivo and in ova treatments were discussed.

ISYN, first described in 1954, was identified in all broiler areas, caused condemnation and trim out and its etiology was undetermined. In 1957, the committee stated that ISYN may be egg transmitted and, in 1958, a paper was presented on its control with antibiotics.

Also, in 1958, the committee said the ultimate aim for controlling mycoplasma CRD is eradication from laying flocks. CRD and IS were still the most prevalent of poultry diseases, costing \$60 million annually. The next year the committee said the role of pathogenic mycoplasma in CRD was still not established, but there was little doubt of its association with IS in turkeys.

In 1959, the committee reported serious losses to the industry through condemnations upon the initiation of mandatory federal poultry meat inspection. A high percentage of the loss was due to infections of the respiratory tract. In 1960, the committee reported air sac infection was reproduced with mycoplasma, E. coli and infectious bronchitis mixed infection. Observations on immunizing chickens and turkeys against mycoplasma were discussed. The name, Mycoplasma gallisepticum (MG), was noted for the first time in the proceedings. The committee recommended immediate consideration of the availability of an efficient antigen for PPLO because early detection of infection cannot be divorced from the high condemnation rate in poultry processing plants. In 1960, ISYN was shown to be caused by mycoplasma infection and a paper on diagnosis of the disease was presented.

In 1961, the broiler industry was suffering another year of high condemnations, with respiratory diseases the most important factor. The next year a paper was presented on avian PPLO and a research basis for a control/eradication program and the committee recommended ARS undertake the manufacture and standardization of diagnostic antigen for MG. In 1963, the committee said progress had been made toward eradicating IS from turkeys and PPLO (S6) from chickens. The importance of a uniform antigen was discussed and USDA accepted the responsibility. Many chicken breeders developed PPLO-free chicken flocks. USDA was developing a plan for MG eradication, to be submitted to USLSA, NTIP, NPIP and industry for approval.

In 1965, Minnesota rules and regulations for control and eradication of MG in turkeys were submitted to the association for review and, in 1966, the committee commended the NPIP proposal for mycoplasmosis control and recommended USLSA support the program as published in the Federal Register. The committee discouraged live exposure for control of mycoplasma and encouraged USDA to delay licensing mycoplasma

biologics. In 1968, the committee directed attention to the rapid progress being made to develop MG-free foundation breeding flocks and the adoption by NTIP of an MG program.

In 1974, the committee recommended that USDA continue supplying reference antigens not commercially available for mycoplasma. In 1976, atypical cases of MG were discussed and the committee reported that *Mycoplasma meleagridis* (MM) free turkey breeder stock will soon be available. A subcommittee on mycoplasma was formed.

The committee stated in 1977 that mycoplasma infection rate had declined in recent years and the problems now were atypical infections. Almost all turkey and chicken breeding flocks were free of MG and chicken breeding flocks were free of *Mycoplasma synovitis* (MS). Progress in MM-free turkey breeders was noted and controlled mycoplasma exposure in multiple age egg laying premises discussed. In 1978, a paper on artificial F strain MG exposure of egg layer chickens was given.

In 1981, USDA was asked to appropriate \$150,000 to develop a program to eradicate mycoplasmosis from multiple-age layer farms and another \$100,000 to help in the examination of mycoplasma reactors. Avian mycoplasmosis was costing the egg industry \$97 million annually. Recommendations were that USDA provide necessary diagnostic materials; study the epidemiology of mycoplasma including the cost/benefit of live and killed vaccines and check test laboratories in mycoplasma diagnostics. Also recommended were continuation of funding of NVSL diagnostic referral; accelerated participation of multiplier breeders in NPIP MG and MS program, and investigation of variant and standard outbreaks of MG, MS and MM.

In 1983, widespread outbreaks of MG in turkeys were reported in several states. Breeder flock infection was not thought to be the cause. In 1986, the committee recommended improved biosecurity in egg layer flocks for mycoplasma; that live F strain mycoplasma vaccine should be under control of the state animal health agency, and reliability of mycoplasma antigens should be investigated by USDA. In 1987, USDA was asked to put into effect import requirements for MG, MS and MM; states were urged to improve mycoplasma testing and identification capability, and NVSL was asked to institute training and provide reagents. The committee also recommended that USDA keep SDA-PAGE fingerprints on live vaccine strains of mycoplasma; that states regulate live mycoplasma vaccination and mycoplasma vaccine use should be approved on a case by case basis.

From 1989 to 1993, the committee asked USDA to develop specific MG and MS antigens and improved MG and MS conjugates and reference antisera; to continue supplying mycoplasma reagents; to support NVSL to provide personnel for mycoplasma serologic testing, and to develop quality assurance in avian mycoplasma testing.

In 1994, the subcommittee on mycoplasma made five recommendations pertaining to mycoplasma control, which included the need for improved laboratory reporting, statewide notification of outbreaks, cooperative sharing of information between states on movement of infected birds, testing of male breeder replacements before introduction into breeding flocks and that MG or MS infected primary breeding flocks (and multiplier breeder flocks) should be depopulated and their hatching eggs destroyed.

Laryngotracheitis

In 1932, a paper on immunization against laryngotracheitis (LT) was given and in 1935, the committee condemned the indiscriminate distribution of LT vaccine. In 1937, the committee discussed the new AVMA definitions of respiratory diseases and that infectious bronchitis (IB) is caused by a separate virus from LT; the term "roup" is to be discarded; LT vaccination is beneficial, but eradication is preferred.

In 1950, the committee said LT had come into prominence after several years of low incidence and in 1957, stated that vaccine standardization for LT is needed. In 1961, the committee reported numerous breaks in LT vaccination had stimulated new research and in 1963, reported that LT vaccine applied to the conjunctiva had been developed.

In 1973, a program for eradication of LT from New England poultry flocks was discussed and in 1989, the new LT eradication subcommittee stated that eradication of LT is feasible and proposed a model four-phase eradication program. In 1990, the committee recommended that USDA implement an LT eradication program. In 1995, the subcommittee on LT eradication concluded that eradication is not practical and recommended the subcommittee's name be changed to the subcommittee on LT.

Infectious Bronchitis

In 1930, A. F. Shalk presented a paper on a new respiratory disease of baby chicks and J. R. Beach discussed studies of the etiology of laryngotracheitis (infectious bronchitis) of chickens. Shalk subsequently published a paper in 1931 on an apparently new respiratory disease of baby chicks which is generally recognized as the first report of infectious bronchitis (IB).

In 1937, the committee discussed the new AVMA definitions of respiratory diseases and that infectious bronchitis (IB) is caused by a separate virus from laryngotracheitis. In 1949, the committee said respiratory problems, exclusive of ND, are of great concern and, in some areas, IB exceeds all other problems.

In 1950, the committee said IB remains very serious in the Northeast, perhaps more so than ND. A paper on IB was presented in 1951 and in 1953, the committee said IB was widespread and young vaccination was the only effective way to prevent outbreaks. In 1954, the IB appeared effectively controlled, with widespread vaccination no doubt part

of the reason. Studies showed at least three distinctive strains of IB virus. In 1958, the committee noted that serologic and immunologic differences between the Connecticut and Massachusetts strains of IB virus had been reported.

In 1988, a paper on obstacles to control of IB of chickens was presented and the committee urged USDA to provide service for antigenic (serotyping) identification of IB virus field isolates from commercial poultry. In 1990, a subcommittee on IB was formed and in 1992, the committee urged USDA to provide a national service for identification of IB viruses. In addition, three recommendations regarding surveillance, control and research were offered.

In 1995, the committee noted the need for a recombinant IB vaccine and recommended development of serotype specific diagnostic capability for IB and research on respiratory immunity.

Neoplastic Diseases

In 1930, papers were presented on fowl paralysis and fowl leucemia. In 1933, a paper was presented on leukosis in the common chicken. In 1934, three papers were presented on neoplastic diseases; on the etiologic and diagnostic aspects of fowl paralysis; the etiology of fowl paralysis (neuro-lymphomatosis gallinarum), and on leukosis and allied conditions of the fowl.

In 1938, a paper was presented on wheat germ oil in the control of fowl paralysis and the committee discussed the etiology of fowl paralysis and the possibility of a virus cause of lymphomatosis was postulated. It was stated that these diseases were the major cause of adult mortality. In 1939, the committee stated that the new East Lansing, MI, laboratory would study fowl paralysis and allied diseases as the first item of research, because of the serious problem of adult mortality. The etiology of fowl paralysis was discussed.

In 1941, the committee said the avian leukosis problem was serious and eye, visceral and leukemic manifestations were increasing. In 1949, the committee stated the group of conditions called fowl paralysis remained the number one killer of adult birds with an estimated cost of \$60 million annually. A paper was presented on avian lymphomatosis, another egg-borne disease.

In 1950, the committee reported the fowl paralysis form of leukosis was being observed more often at an earlier age, that the avian leukosis complex continued to take a heavy toll in chickens and probably outranked all other known diseases in loss to the industry.

In 1957, the committee called attention to the finding that the virus of visceral lymphomatosis could be cultivated in tissue cell cultures and the first visualization of the virus particles of leukosis was reported. In 1962, the committee recommended support

from all phases of industry for research on avian leukosis and epidemiological studies directed toward transmission and control.

In 1963, transmission of the lymphomatosis agent by the air route was confirmed and, in 1966, a paper discussed dermal lesions in avian leukosis. The committee, in 1967, recognized avian leukosis as a major problem.

In 1969, the committee commended USDA for efforts to provide a safe vaccine for Marek's disease. In 1970, H. G. Purchase presented a paper on the control of Marek's Disease by vaccination and it was estimated that a vaccine would be available soon.

In 1992, a paper on Marek's disease vaccination was presented and in 1994, the committee discussed problems ensuring freedom of biologics from reticuloendotheliosis virus.

Control of Disease and Industry Representation

In 1934, a paper on the environment and poultry disease was presented. In 1938, a paper was presented on method and practical application of egg-propagated vaccine. The committee discussed the use of live virus vaccines in the control of virus diseases and the indiscriminate use of vaccine was decried. At the 1939 meeting, a paper discussed the control of poultry diseases by the veterinarian and another discussed turkey disease control in commercial flocks. In 1940, a panel discussed poultry information. In 1941, a paper presented three reasons for failure in immunization against laryngotracheitis and pox.

In 1947, discussions included "How can poultry disease control measures known at present be applied to further reduce current losses?" The Committee said disease continued to be a major barrier to the poultry economy and urged further emphasis on reducing preventable losses. Sulfonamides and antibiotics modified the approach to control of transmissible diseases; however, USLSA continued emphasis on the soundness of sanitary programs to control infectious and parasitic diseases, as well as the importance of veterinary services. The use of penicillin was discussed.

Throughout the late 1940's and '50's, papers covered such subjects as sanitation in the control of poultry diseases, hatchery disease control in the future, efficacy of a textile bag sanitizing machine, sanitation and vaccination in the control of ND and other diseases in a large broiler plant, the problems of a state veterinarian in controlling poultry diseases and the need for improvement of poultry disease vaccines. In 1958, the committee commented on the steady finding of variants or changes in the immunological characteristics of poultry viruses and that the occurrence of immunologically distinct types of a virus may seriously complicate already overburdened vaccination schedules. In 1959, the committee again stressed the problem of multiple infections of the respiratory

tract overburdening vaccination schedules and stated that what was needed was improvement in immunization agents and initiation of eradication programs.

In 1960, the committee noted that integration of the poultry industry had markedly influenced operations. The major pitfall was control of disease. The committee endorsed the establishment of a standardized national morbidity and mortality reporting system.

In 1961, the committee agreed with proposed restrictions on interstate movement of poultry and hatching eggs to include sending the health certificate to the state animal health agency. In 1963, a paper discussed the health contributions by primary breeders and the committee commented on the Maine specific pathogen free (SPF) bird program. In 1964, papers were presented on commercial production of SPF poultry and turkey industry disease control programs.

In 1967, the committee asked USDA to promulgate importation requirements involving poultry and poultry products from outside the U.S., and confirmed the philosophy: Why live with a disease if it can be eradicated?

In 1974, the committee discussed several approaches to control and eradication of endemic and exotic diseases and formed a subcommittee on national health programs.

In 1978, the committee discussed problems of aviculture, a \$500 million industry, and recommended that USAHA provide a forum for this industry's problems and liaison with governmental agencies. A subcommittee on cage and aviary birds was formed and in 1979 recommended USDA phase out privately owned bird quarantine stations and construct or modify federal facilities.

In 1981, the Committee on Transmissible Diseases of Poultry became the Committee on Transmissible Diseases of Poultry and Other Avian Species to reflect its new role in cage and aviary birds.

In 1982, the committee recommended that USDA endorse the proposed National Cage and Aviary Bird Improvement Plan (NCABIP) and encouraged research to develop rapid diagnosis for ND and chlamydiosis and determine antibiotic treatment of the various caged birds marketed in the U.S. In 1986, the committee noted that Maryland had adopted a model pet bird improvement plan.

Also in 1982, a paper was presented on ELISA profiling and in 1985, the committee noted the Delmarva poultry industry had developed a procedure manual on emergency diseases and recommended USDA allow veterinary medical officers at the state level to be involved in field investigation of poultry diseases.

In 1990, the committee established subcommittees representing the broiler industry, the egg-type chicken industry and the turkey industry with the purpose of reporting annually

on current status of health and acting as conduits to their constituencies on USAHA activities. In 1993, the Association of Veterinarians in Broiler Production began meeting during the annual USAHA meeting and, in 1995, the National Broiler Council (NBC) became the first national poultry industry organization to join USAHA as an allied organization, giving the poultry industry its first seat on the executive committee. A subcommittee on the ratite industry was added in 1994.

In 1995, a paper on selected risk reduction factors from the SE pilot program was presented by the Committee on Salmonella. Also in 1995, the committee recommended that APHIS import/export staff work with the subcommittee in continued negotiations with poultry-importing countries regarding poultry and poultry products.

Chapter 8--Other Diseases

Glanders

A serious disease of horses and mules, glanders, was the subject of much discussion as state livestock regulatory officials formed the first national organization at the end of the 19th century.

The disease was particularly associated with horses and mules used by armies, back to the fourth century and the days of Aristotle, who gave it the Greek name of malleus. It was also transmissible to humans.

Controversy arose during the meetings early in the 20th century regarding the reliability of the mallein test for glanders. The test, using a sterile extract of *Pseudomas mallei*, was administered by injection or by drops in the eye. A reaction at the test site was evidence of infection and the animals were quarantined until they could be destroyed. At the 1904 meeting, a committee was approved to study the reliability of the test.

A paper at the meeting in 1909 reported that glanders was no longer of much importance and that in a few years the horse will "probably become obsolete, in view of the new method of transportation, the automobile."

The last vestiges of the disease were eliminated in the 1940's.

Foot-and-Mouth Disease

Foot-and-mouth disease (FMD) outbreaks in the U.S. had been eradicated three times before the formation of the organization that became USAHA, in 1870, 1880 and 1884.

The proceedings of the meeting in 1903 reported on an outbreak of the disease in New England during the previous fall and winter. By July of 1903 the outbreak had been eradicated. That discussion prompted questions at the meeting regarding destruction of diseased animals without payment of indemnity.

The proceedings of the meeting in 1909 reported on an outbreak of FMD in Pennsylvania, which was quickly stamped out, but not before it spread to several other states. The outbreak was traced to contaminated smallpox vaccine, which apparently also was the source of the outbreak a few years before in New England. This prompted a requirement that all manufacturers of vaccine for human use test it for FMD.

A large outbreak starting in 1914 first appeared in hogs in Michigan and had spread to 20 states by the time of the annual meeting of the organization in early 1915. Cause of the outbreak was release of contaminated hog cholera serum obtained from hogs not showing lesions of the disease at the time of slaughter. By February of 1915, 2,245 herds had been

infected, involving almost 53,000 cattle, more than 7,000 sheep, nearly 52,000 hogs and 23 goats. All infected and exposed animals were destroyed and buried.

That outbreak prompted a recommendation by the executive committee of the organization to all state governors that the states take action to acquire authority to control hog cholera serum laboratories operating within the state without a federal license.

A problem that apparently had arisen in some states was hinted at by the FMD committee report during the 1915 meeting which "emphatically condemns all attempts at state legislation or personal action to interfere with the federal regulation now in force for the control and eradication" of FMD.

At the 19th meeting in 1915, the committee on legislation pointed out that the recent FMD outbreak demonstrated the urgent need for both federal and state emergency funds for use in such outbreaks.

Outbreaks were eradicated in 1925 and 1929 and, in 1946, when the disease broke out in Mexico, the U.S. responded with about \$120 million and veterinarians who worked in the country to eradicate the disease. In 1947, USLSA sent a committee of four state veterinarians to observe the eradication effort and make recommendations on future actions to protect the U.S. A detailed report on the conclusions of that committee and on the eradication effort, by Dr. Frank Mulhern, who was one of the U.S. veterinarians taking part, is included in the proceedings of the 98th meeting of USAHA.

One of the recommendations of that committee, that a research laboratory on FMD be built on an isolated U.S. island, resulted in establishment of the Plum Island Research Laboratory in the 1950's.

The disease continues to be a research subject at Plum Island and a concern of federal and state regulatory authorities.

Screwworms

The proceedings of the 1936 annual meeting contain a discussion on screwworm control. A serious outbreak had occurred in the Southeast in 1934 and in the Southwest in 1935. Congress appropriated \$460,000 for control work in 1936, including meetings and demonstrations; bezol and pine tar were furnished for treatment of animals.

Until the eradication program began in the late '50's, this problem required screwworm prevention treatment on every castration and dehorning wound, every nick in the skin left by sheep shearers, every wound left when lambs were docked, every wire cut and any other wound.

Eradication involved a radical new biological control developed under the leadership of Dr. Edward F. Knipping and Dr. Raymond C. Bushland. This environmentally friendly method of controlling insects, pioneered with screwworms, is now being used in other insect eradication efforts.

It involves sterilization by irradiation and then release of millions of sterile male screwworm flies which overwhelm and wipe out the natural population.

This method had been tried in 1954 on the island of Curacao and screwworms were eradicated in just four months. In July of 1958, eradication using the sterile insect technique was begun in the southeastern states and completed in 1959, with a quarantine line established at the Mississippi River to prevent reinfestation.

A unique effort to pursue eradication west of that line resulted in organization of the Southwest Animal Health Research Foundation (SWAHRF) by the livestock industry. It was financed by a volunteer tax on a per animal basis on members. That assessment raised several million dollars to start the program.

SWAHRF paid about 25 percent of program costs in the first years of the program, and all of the cost of construction of the screwworm production plant at Mission, TX, along with the cost of designing and constructing the Husman irradiator which is now used for all screwworm pupae sterilization.

The eradication effort began in the southwest in 1962, and by 1966, overwintering U.S. screwworm populations were eradicated. But reinfestation occurred each year until screwworms were eradicated from northern Mexico. An eradication agreement was signed with Mexico in 1972 and a new plant in Mexico began producing sterile flies a few years later.

SWAHRF became an international organization, with members from Mexico as well as the U.S., dedicated to eradication from North and Central America and Panama. The last field case of screwworms was reported in the U.S. in 1982, in 1991 eradication was completed in Mexico and the effort has moved to Central America, with the goal of eradication in all the area including Panama in sight.

Pseudorabies

The latest eradication effort in which USAHA is playing a role involves pseudorabies in swine. The first mention in proceedings is found in the report of the 1968 meeting. A resolution approved in 1976 called for state quarantines for the disease and endorsed the concept of eradication.

This disease, which had been present at a low incidence for many years, suddenly became widespread as the virulence of the virus apparently changed. Concentrated outbreaks

were reported in 1973 and 1974 in the Midwest, primarily Illinois, Indiana and Iowa. The disease apparently was spread by infected breeding stock and by neighborhood contact.

Meetings began in the mid-70's with pork producers demanding controls on movements and quarantines of infected herds.

Controversy in the pork industry regarding the question of control or eradication continued during the late '70's and culminated in the early '80's in a plan for pilot projects to resolve questions about eradication. As the pilot projects got under way, states with little or no disease began seeking classification as PRV-free areas to facilitate movements. Under the leadership of the Livestock Conservation Institute and with representation from USAHA, a task force wrote specifications for two stages, one of which was a free stage. When questions arose on who would oversee the stages and designate status of states, the idea of an industry organization, with membership from USAHA, the Livestock Conservation Institute and the National Pork Producers Council surfaced.

This group, called the National Pseudorabies Control Board, was endorsed by USAHA at its meeting in 1985. The Board, made up of two representatives appointed by each organization, continues in an advisory role to APHIS in reviewing state applications for status in the eradication program.

When the results of the pilot studies unified the industry in favor of eradication, an industry group headed by a pork producer and including two state veterinarians, was assembled to draft an eradication plan for consideration by the industry. That plan was approved by pork industry groups during the winter of 1986-87, by the National Pork Producers Council in March of '87 and by USAHA that fall.

USAHA then assumed the role that had become traditional in such programs, writing the proposed regulations to put the industry plan into effect, in this case called program standards. The organization has continued in that role, considering and passing on proposed changes in the program standards. The initial program standards proposals were considered at the annual meeting in 1987, approved in final form in 1988, and were published by USDA-APHIS early in 1989, signaling the start of the eradication effort.

A major development in the effort was the creation of gene-deleted vaccines, which first became available in 1988. They permitted discrimination in test results between titers from vaccinated and field exposed animals.

As this is being written, the program, with a goal of complete eradication by the year 2000, has met its goals for 1994 and 1995. A total of 20 states are in the free stage; 8 are in Stage IV--which means they have had no cases for a year before qualifying for the stage; one is split between stages III and IV; 13 are in Stage III, which is the compulsory herd cleanup stage for state or areas with less than 1 percent prevalence; 5 are in split

status with major portions in Stage III and smaller, densely populated areas with more infection, in stage II, and 3 states remain in the preparatory stage.

The 1996 goal of 32 states in Stage IV or higher is in sight, and a second goal of only 3 states remaining in Stage II has already been achieved. The goal of eradication by the year 2000 is attainable.