Dedication to avian studies

Dr. Kenneth L. Bullis

In 1922, having just reached 16 years of age, I graduated from a high school in southern DeKalb County, Ill with a decision to continue studies in chemical engineering. I entered Bradley Polytechnic Institute in Peoria, Ill, but after experiencing some difficulty with calculus, as well as qualitative and quantitative chemistry, I concluded after the first year that I was not destined to be an engineer.

I stayed out of school for a year, then decided to study veterinary medicine. I was accepted by Iowa State College. After graduating in 1928, I did not have a clear concept of the future. A veterinarian in Chicago Heights, Ill wanted me to take over his practice and a small animal hospital for a year. This didn't suit me so we compromised on a four-month stint while he took a vacation. After completing this, I had the car packed and was all set to enter a small animal practice in Buffalo, NY when my dad talked me out of going. Being a rugged individualist, he had been reared in upper New York and Vermont and felt firmly that the East was pretty well matured.

Instead, I set off for California. In Los Angeles as a young fellow with no particular skills other than my professional training, and with the licensing examinations being some months away, I could not beg or buy a job, so I elected to try meat inspection. To join the California inspection service, it was necessary to spend two weeks training at the trainee's expense.

As the end of two weeks in packing plants near Los Angeles and Modesto approached, I received a call from Sacramento. The caller asked if I would consider working in San Francisco. The nature of the job was not entirely clear, but he was the boss of the man for whom I expected to work as a meat inspector, so I accepted and went to work the next morning on the waterfront.

An outbreak of foot and mouth disease was winding down and a new type of quarantine was being set up in connection therewith. Another veterinarian and I became engaged in boarding all boats entering the harbor, and those that had foreign meat on board were to have their refrigerators sealed while in port and were advised not to throw their garbage overboard. This was a most interesting assignment for a landlubber, but the glamour began to wear off after a few months.

A letter came from Amherst, Mass offering a position. After a couple of exchanges and assurance that I would not be in a poultry diagnostic laboratory, I accepted. To make a long story short, I joined the staff of the Dept. of Veterinary Science at the Massachusetts Agricultural College on Sep 29, 1929 to work with their pullorum disease control program. Approximately 10,000 blood samples collected by 18 men came to the laboratory daily by Railway Express for agglutination testing. This created work for some personnel on the seventh day. Initially, this routine was a bit strange, so it was a busy winter.

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so I caught up through plenty of "on the job" training. In 1934, I began doing mostly poultry diagnostic work. At this time, much of the collected information on diseases of poultry was in a USDA bulletin, and books by Ward and Gallagher, Kaupp, Reis & Nobrega (in Portuguese), and Van Heelsbergen (in German). A translation of the latter was parceled out to specialists in various fields for revision and updating and appeared in 1943 as *Diseases of Poultry*. Because there were not many qualified specialists in diseases caused by fungi, I edited that section for the first few editions until a qualified individual was located. The ninth edition is now in available.

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It was recognized early that laboratory examination was of importance in the diagnosis of poultry diseases. With the provision of special buildings in 1900, the Department stood ready to examine specimens of diseased animals. Agglutination testing for pullorum disease began in earnest in 1915 and an official program was inaugurated in 1919. The control and eradication of pullorum disease was of great importance in the development of the poultry industry. This program also contributed greatly to expanded work in avian pathology. Dr. F.R. Beaudette was to opine a few years later that pullorum programs constituted a real foundation for the establishment of expanded studies and services in avian pathology.

Using conferences for education

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In 1957, the name of the conference was changed to the Northeastern Conference on Avian Diseases. The conference served as a model for regional avian meetings organized across the country. It was also a distinct forerunner of the American Association of Avian Pathologists (AAAP), which was organized in 1958 to become a part of the AVMA annual meetings.

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The poultry industry and the avian pathologists who serve it

expanded together. The early elimination of pullorum disease was primarily in the Northeast and the Pacific Northwest. The blood test, which was demonstrated by Dr. H. Bunyea at the conference in Amherst in 1931, was of importance in the Midwest because of the convenience and low cost. It was difficult to convince individuals of the economic importance, when a farmer's wife in Wisconsin understood that, in buying 100 chicks, a mortality of 15 to 25% was to be expected and that a broiler producer in Iowa could expect 15 cents for a 3-lb bird. The fee for each tube agglutination test in Massachusetts declined from 10 cents in 1930 to 5 cents in 1936. During World War II, the annual number of tests in Massachusetts increased to more than one and one-fourth million.

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Expansion in avian studies

The two-pronged goals of the National Poultry Improvement Plan, introduced in 1935, greatly increased the elimination of pullorum disease and decreased the need for Record of Performance (ROP) breeders association.

The expansion of the broiler industry in the early 1930s was aided and abetted by identification of the gender of day-old chicks through feather patterns by cross breeding, especially the use of Barred Plymouth Rock males with New Hampshire females. The determination of gender in day-old chicks by examination of the vent was introduced at about the same time by the Japanese. While Dr. C.S. Gibbs was a missionary in China, he had learned the procedure, so he taught it to a few individuals, and some of them started schools. The broiler industry greatly expanded during World War II. In Massachusetts, unused factory buildings were converted to broiler production. It was opined that the production of poultry meat could change the nutrition of the world. To facilitate this, it was suggested that, in third world countries, fertilizer, cement factories, and egg incubators be increased. A high-energy feed was recommended for poultry in the late 1930s and early 1940s, and after fairly rapid acceptance, a ton of ration consisted of 1,200 lbs of corn and 600 lbs of soybean meal, with miscellaneous ingredients making up the remainder. With continuing industry expansion after the war came the concept of vertical integration, ie, production, processing, and marketing being controlled within one organization.

Prevention and eradication were the principal tools for controlling diseases of poultry prior to the mid 1930s, aside from vaccination to prevent fowl pox, laryngotracheitis, and treatment for internal and external parasites. The coccidiosis barrier was breached about 1937, when sulfur was introduced for prevention. Several new species of *Eimeria* were recognized in the next few years and coccidiostats, antibacterials, and histomonostats followed shortly.

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A vaccine for laryngotracheitis was made available shortly after identification of the causative agent. Infectious bronchitis was recognized at about the same time, and for a few years, there was terminology confusion between the two diseases, but they proved to be different. Those who had worked most to produce a vaccine had the least confidence that one would be perfected. The effects of an outbreak in a young laying flock was devastating. In 1941, Dr. H. Van Roekel initiated an exposure program, exposing pullets prior to beginning production at a time when the effects were less severe economically. Partly as a wartime measure, this became an official program in 1944 and continued until 1955, when a vaccine using an egg-attenuated strain of infectious bronchitis virus became available. Newcastle disease was recognized on the eastern seaboard in 1945 and vaccines became available shortly thereafter. Oddly enough, Drs. Carl Brandly and H.E. Moses began to appear at meetings. It was known that they were stationed at Harvard University,

but it wasn't learned until after the war that they were working on exotic diseases, including Newcastle disease.

The field of respiratory diseases was clarified somewhat when the cause of chronic respiratory disease was identified as a bacterium in 1952. Antibacterials were used for treatment and, in the mid 1950s, Dr. H. Van Roekel established an agglutination testing program for the identification of noninfected flocks.

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Chicken embryos were used considerably in the battle against respiratory diseases. They were also used for miscellaneous immunity tests for viral respiratory disease, especially in differential diagnosis.

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As a neophyte diagnostician in 1932, I had an "eye opening" by the recognition of salmonellosis in newly hatched chickens. We knew of heavy mortality in turkey poults, but most of the literature seemed to deal with the disease in ducks. Affected flocks were tested a few times with a homologous antigen and some reactors were removed, but we were never convinced that testing eliminated the disease. In later years, salmonellosis became of great importance because of the involvement of human beings, with poultry and eggs sometimes being held responsible. Dr. G.H. Snoeyenbos became a leading investigator in the field.

In 1950, I was transferred to administration, with a teaching responsibility. Following World War II, the federal government had instituted a program to introduce US advances in science to foreign scientists. Foreign veterinarians interested in poultry diseases included our laboratory on their itinerary. These individuals would stay for one, two, or three weeks or perhaps for months. Another contact was of interest. The University of Hokkaido, Sapporo, Japan, had been founded at the invitation of the Japanese government some 80 years earlier by the president of the Massachusetts Agricultural College. A relationship was resumed and, over a period of 10 years, 40 Japanese professors were at Amherst for three to nine months and two Massachusetts professors were at Sapporo for two years. Two of the former became deans of the veterinary college. Attendance in 1976 at the 100th anniversary of the founding of the University of Hokkaido augmented foreign travel, which included three International Veterinary Congresses in Europe in 1953, 1959, and 1963.

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Dr. Bullis retired in 1961. He is busy recording the history of diseases of poultry in the United States. He enjoys attending veterinary meetings to continue contact with fellow veterinarians. He now resides in a retirement center in Sarasota, Fla.