The History of Avian Medicine in the United States. VII. Developments in Avian Pathology with Emphasis on Avian Practice[A]

W. R. Hinshaw

140 Kline Blvd.
Frederick, Maryland 21701

EARLY HISTORY

Fifty years ago a veterinary practitioner who professed an interest in poultry was hard to find and he probably did not expect to add to his income by advice or aid given on poultry disease problems. The situation has changed in the past half-century, but the opportunities which exist are still greater than the interest shown. It is equally true that the poultryman of 50 years ago seldom asked his local veterinarian for help in solving his problems. The poultry industry now recognizes that the veterinary profession plays an integral part in its economy. This change has been due to the untiring efforts of a number of individuals and agencies including the veterinary press which has been publishing an increasing number of articles on all phases of poultry research. National organizations such as the American Veterinary Medical Association, the United States Livestock Sanitary Association and Poultry Science Association, as well as their local counterpart organizations, have played major roles in convincing both the veterinarian and the poultryman that they have mutual problems and interests. The USDA, Bureau of Animal Industry (ARS), the agricultural experiment stations and veterinary schools also have done much to show both the poultryman and the veterinarian that the poultry industry needs the services of the veterinary profession.

Although few practitioners were concerned with poultry disease problems 50 years ago, there were a number of veterinary scientists who already had made outstanding contributions to this field. Names of American scientists associated with early developments in poultry disease research include many who were responsible also for the early advances in other animal disease

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research. Familiar names are Theobald Smith, D. E. Salmon, V. A. Moore, Samuel Cushman, Cooper Curtice, J. R. Mohler, A. R. Ward, and Leo F. Rettger.

Many of the diseases now known as causes of mortality in poultry were recognized previous to 1905, but much of our present-day knowledge has come from basic research since then. Examples of information on poultry diseases available to the public in the era before 1905 are: A general bulletin, Infectious Diseases of Poultry by Theobald Smith published in 1895; a bulletin on fowl typhoid published in Rhode Island in 1902 by Cooper Curtice; a report on avian tuberculosis in Oregon by Pernot in 1900; a bulletin on fowl cholera and another on avian tuberculosis published in California in 1904 by A. R. Ward; and a number of reports on histomoniasis published from 1893 to 1900 by Cushman, Smith, and Moore. Theobald Smith first accurately described the causative agent of histomoniasis (blackhead, infectious enterohepatitis) of turkeys in 1895. The first published report on fowl cholera in the United States was made in 1880 by Salmon. This is the same year that Pasteur reported his famous research on the successful use of an attenuated strain of the fowl cholera organism for immunization against the disease.

PROGRESS 1905-1920

The above remarks are intended to emphasize that a great deal of background for future research in poultry diseases had been laid previous to the initial publication in 1905 of the *Iowa-Nebraska Veterinary Bulletin*, the forerunner of VETERINARY MEDICINE. A new era in research in this field was underway, however, at that time, as is indicated by the fact that a number of experiment stations had established formal projects on poultry diseases. Men who were devoting considerable time on poultry disease control during the period 1905-1910 include A. R. Ward, California; W. B. Mack, Nevada; Cooper Curtice and P. B. Hadley, Rhode Island; Raymond Pearl, Maine; and Leo F. Rettger, Connecticut. It was during this period that Rettger demonstrated that pullorum disease (then known as bacillary white diarrhea, or BWD) is transmitted through eggs laid by carriers. Raymond Pearl, with F. M. Surface and M. R. Curtis of the Maine Agricultural Experiment Station published, in 1911, a 216-page experiment station bulletin on diseases of poultry which seven years later was revised and published as a text book.

Beginning about 1910, poultry disease research was developing into a specialty and by 1920 many of the names which have become famous because of their contributions were appearing in the literature with increased frequency. Included is L. D. Bushnell of Kansas State College, who later trained several well-known specialists who are still active. A man who contributed considerable to the practical control of poultry diseases is the late Dr. B. F. Kaupp. His book on poultry diseases first appeared about 1914.

It was during this decade that Dr. F. S. Jones (1913) described the macroscopic agglutination test for detecting carriers of pullorum disease. The early applications of this test made by Rettger in Connecticut and Gage in Massachusetts did much to make possible the pullorum disease eradication program which is now being so effectively carried out by the National Poultry and Turkey Improvement Plans.

Drs. L. Van Es and A. F. Schalk began their classic series of bulletins and articles on avian tuberculosis with a report on this disease in North Dakota in 1914. Dr. Van Es in research at the University of Nebraska 20 years later showed conclusively that, to eradicate tuberculosis from swine, it must be first eradicated from chickens.

In 1920, Dr. E. E. Tyzzer of Harvard University made an outstanding contribution when he described the causative agent of histomoniasis and renamed it *Histomonas meleagridis.* In the same year, Graybill and Smith at Rockefeller Institute showed that the cecal worm *Heterakis gallinae,* common to both chickens and turkeys, was the carrier of *Histomonas meleagridis.* These research accomplishments made it possible to later develop sound managerial technics for prevention and control of this important disease of turkeys.

Men who entered the field of poultry disease research towards the end of the decade ending in 1920 and in the early 1920's include Drs. J. R. Beach, F. R. Beaudette, H. J. Stafseth, H. Bunyea, W. T. Johnson, E. L. Stubbs, L. P. Doyle, E. L. Brunett, W. R. Hinshaw, C. A. Brandly, and E. P. Johnson. No attempt will be made to give the large numbers of persons who entered this field after the early 1920's but their contributions have added equally to the vast knowledge now available to practitioners. The text book published by Drs. A. R. Ward and B. A. Gallagher in 1917 and revised in 1922 was a standard reference for many years.

PROGRESS 1920-1955

The period since 1920 has seen an astounding yearly increase in emphasis on research in poultry diseases, as well as in all phases of the poultry industry. In 1920, few of the state colleges, universities and experiment stations had even one person devoting his time to poultry disease research. In contrast, the majority now have from one to several persons devoting full time to some phase of poultry disease control or research.

A service both to veterinarians and poultrymen which has become popular is that of a centralized diagnostic laboratory supported by agricultural experiment stations, veterinary schools, by state and/or county livestock control agencies. Three of the earliest of these were started from about 1917 to 1920 at Kansas State College; at University of California in Petaluma; and at Western Washington Experiment Station in Puyallup. In a survey recently completed by the USDA, a list of 93 poultry diagnostic laboratories supported by state funds was compiled. In California, there are now eight such laboratories. These laboratories are generally well equipped and staffed by trained personnel. A need for improvement in diagnostic facilities is however indicated by the USDA survey. It revealed that less than 20% of the 93 laboratories listed, are sufficiently staffed and equipped for special diagnosis of foreign and domestic diseases requiring special technics. This survey did not include the private practitioner owned diagnostic laboratories. It is estimated that in Iowa there are some 70 practitioners who devote some time to avian practice and have limited diagnostic facilities.

It would be impossible to review all the accomplishments in poultry research made in the past 35 years. Volumes have been written and veterinary journals have been publishing papers related to all phases of the industry. *Poultry Science*, the official publication of Poultry Science Association, has had to increase its number of pages per issue frequently to keep up with the manuscripts submitted. Many of the scientific biological journals also devote much time to poultry subjects. In 1920, very few of the veterinary schools offered courses in poultry husbandry and poultry diseases to veterinary students. Now all of them require both.

An outstanding advancement in support of poultry disease research was the establishment, in 1939, of a Regional Poultry Research Laboratory at East Lansing, Mich. This laboratory, operated by the USDA in cooperation with several experiment

stations, has made some outstanding advances in our knowledge of the avian leucosis complex, one of the most costly of poultry diseases. Regional cooperative research on other diseases supported by federal funds is now accepted as the most effective and economical method of solving future poultry disease problems. Examples of other poultry diseases that are being studied by this method are Newcastle disease and chronic respiratory disease (CRD). The latest cooperative regional project to be sponsored by the USDA is one on ornithosis of turkeys.

THE POULTRY INDUSTRY NEEDS AVIAN PRACTITIONERS

The poultry industry has become one of the largest of the agricultural industries. It has grown both in value and in numbers of birds and is now considered to be valued at nearly $2,000,000,000. It is estimated that the total losses from poultry disease in the U. S. exceeds $300,000,000. annually. These values emphasize the need of the poultry industry for adequate help in handling its health problems. Although practicing veterinarians have been showing increased interest in the health of poultry flocks in their communities, many areas are without help. Practitioners have been prone to blame the lack of interest of poultrymen to utilize their services because too much free service is given by federal, state and county agencies, feed concerns, hatcheries, and remedy salesmen. This is partly true but the local veterinarian, in many cases, has been responsible for the inroads on his business by such agencies because of his own lack of interest. Poultry disease specialists in state colleges and veterinary schools have been emphasizing for years the needs of the poultrymen for veterinary service, have published special bulletins, held poultry clinics and cooperated with the state and national associations in holding special poultry disease programs in an effort to improve the effectiveness of veterinarians to handle poultry disease problems. The veterinary journals have published special poultry issues and have solicited special feature articles in their attempts to promote poultry practices. There have become available to practitioners numerous new reference books on all phases of poultry. These include, Diseases of Poultry, edited by Drs. H. E. Biester and L. H. Schwarte and written by more than 30 specialists in their particular field. It was first published in 1943 and is now in its third revision. Another text book is Diseases and Parasites of Poultry by Drs. E. H. Barger and L. E. Card, also first published in 1943.

The late Dr. D. M. Campbell, editor of VETERINARY MEDICINE from its inception until his death in 1952, pioneered in promoting avian practice. Evidence of this is the increasing amount of space he devoted to poultry subjects during the years of his editorship. As early as 1911, he started to call attention of veterinarians to the need of their aid in controlling poultry disease. In an editorial on page 657 in vol. 6 (1911) of the *American Journal of Veterinary Medicine*, he stated, "But few veterinarians take an interest in treatment of diseases of chickens, yet the industry is one of the largest. This field is one of which veterinarians should give more attention than they have in the past, and it is one in which veterinarians may build up a lucrative practice." One of the early contributors to the Journal was Dr. B. F. Kaupp who, in vol. 7, page 248 (1912), wrote on mites in chickens. This was followed in the years to come by numerous articles by him and for a few years he was designated as a Department Editor on Poultry Problems.

Subjects covered in these early issues included blackhead of turkeys, internal and external parasites, milkweed poisoning, corn cockle poisoning, tympany of the crop, fowl cholera, bacillary white diarrhea (pullorum disease), tuberculosis, forage poisoning, fowl pox, and caponizing. Most of these articles were in the nature of case reports, control recommendations, and question and answers rather than original research. Beginning in 1920, the number of references increased yearly with continued emphasis of short items of interest to practitioners. It will be recalled that it was in 1924 and 1925 that both fowl plague and the disease now known as infectious laryngotracheitis appeared in the United States for the first time. The appearance of these diseases stimulated increased emphasis on research on poultry diseases. Doctor Campbell continued to emphasize to his readers the importance of poultry disease as a veterinary problem and there has been an increase in original articles.

An article by Dr. F. R. Beaudette, The Field of Poultry Practice and Its Relation to the Practitioner, and one by myself, Differential Diagnosis of Poultry Diseases and Technic of Postmortem Examination of the Fowl, both published in 1924 are examples of attempts to interest the practitioner in an avian practice in the early 1920's. In 1928, 38 articles were reprinted from VETERINARY MEDICINE into a booklet titled, Poultry Practice. This was revised and reprinted in 1930. In 1940, a 3rd edition was completely rewritten under the editorship of Dr. L. D. Bushnell. To

further stimulate interest in avian practice he re-established in VETERINARY MEDICINE in 1948 a special department on poultry practice. A project which has added materially in developing interest in avian practice is the holding of special short courses and clinics featuring poultry husbandry and disease control. Pioneers in this field were Kansas State College and Purdue University.

These attempts have paid dividends, and more and more practitioners are finding that there is additional income to be had by giving attention to poultry. There are a number of examples of men who have made a success with a poultry practice either as a specialty or in connection with a general practice. Examples that I personally know about, and I am sure there are many others, are as follows:

Dr. C. M. Carpenter established a specialized practice in Petaluma, Calif. in about 1924. Later, he moved to southern California and continued there until he gave up his practice to enter other fields of activity. He is currently, President of the Institute of American Poultry Industries, Chicago. Dr. D. E. Davis, began a specialized poultry practice in Petaluma about 1926, after having been in charge of a University of California Poultry Research Laboratory in Petaluma for a few years. He and his partner, Dr. W. H. Dungan also operate a "chicken pharmacy." Another veterinarian in Petaluma, Dr. W. E. Brandner, has for a number of years successfully combined a poultry practice with a dairy practice. These men have been located in an area where poultry is raised as a major industry. They have an advantage of having available in Petaluma one of the oldest state-supported diagnostic laboratories.

In Vineland, N. J., which is the eastern counterpart of Petaluma, Dr. Arthur D. Goldhaft has operated a specialized poultry practice since about 1920.

Examples of general practitioners who have been devoting major efforts to poultry are: Dr. F. C. Tucker of Claypool, Ind; Dr. E. S. Weisner of Goshen, Ind. and Dr. M. P. Chapman of Sherwood, Ore. Doctor Tucker lives in Kascuisko County, Indiana, a county which claims to have the highest poultry population of any county west of the Allegheny Mountains except for the Petaluma area of California. Doctor Tucker has maintained an active avian practice since 1925. He reported on 25 years of his experience as an avian practitioner at the 86th annual meeting of the A.V.M.A. in Detroit

in 1949. Doctor Weisner obtained his background in poultry diseases under Dr. H. J. Stafseth, and for a few years was an extension specialist in poultry diseases in Michigan. He serves his own community and acts also as a consultant and specialist for the surrounding territory. Doctor Chapman is a general practitioner located near Portland, Ore. He discussed his views on this subject at the 91st annual meeting of the A.V.M.A. in Seattle in 1954.

Little mention has been made of turkeys as a source of income to be considered by the practitioner. Both the value of an individual bird and the total value of a commercial flock merits the interest of the veterinarian as a source of income. A single male turkey at market age may be worth $10. to $15., and a flock of 5,000 turkeys at least $35,000. by market time. Many turkey growers have as much invested as do swine, sheep, or cattle raisers. A veterinary team which has developed a service to turkey growers is that of Drs. Clifford Nelson and Robert Ahrens of Jewell, Ia. Their interest in turkeys and the services they are rendering attracted the attention of an editor of *Turkey World*, Mr. Alex Gordeuk, who interviewed them and published a tribute to their work (*Turkey World*, July 1, 1955). Doctor Nelson also reviewed his experiences at the 92nd annual meeting of the A.V.M.A. in Minneapolis, Minn. in 1955. Doctor Nelson admits that he has one of the most important attributes for an avian practitioner in that he has always had a personal interest in poultry.

DEVELOPING AN AVIAN PRACTICE

I have about as much right to give advice on developing a poultry practice as a child specialist who has no children has to give advice on how to bring up children. I have had no experience in private practice since graduating from veterinary college. I have, however, had 32 years experience in avian pathology research, much of which has been working directly with poultrymen and veterinarians under field conditions, and have accumulated some ideas that may prove of value.

I would strongly advise anyone thinking of starting a poultry practice to consult one or more of the number of practitioners who have made a success in this field. A good start would be to review the papers given at the Symposium on the Role of the Veterinarian in the Control of Poultry Diseases given at the 91st annual meeting of the A.V.M.A. in Seattle, Wash., August 23-25, 1954. A paper given in the symposium by Dr. M. P. Chapman, a practitioner in Sherwood, Ore., is especially recommended. I can do no better than

to repeat many of the points emphasized by Doctor Chapman since they coincide so well with my own observations and ideas. One of the first prerequisities to developing an avian practice is to have a keen personal interest in poultry. An avian practitioner must have a workable knowledge of poultry husbandry and if not an expert in all husbandry practices must at least be able to cooperate with the poultry owner in getting him the best available information if it is needed to help him prevent losses. He certainly should know the various breeds and varieties of fowl and be able to converse in the language of the poultryman.

All the veterinary schools now require courses in poultry husbandry and give courses in poultry diseases including clinical and laboratory training in diagnosis. I agree, however, with Doctor Chapman, that it will pay a veterinarian to get additional experience by working in a state or federal diagnostic laboratory, or taking special graduate courses in poultry including nutrition, management, as well as diseases, and/or by working with a practitioner before embarking on his own project.

One thing which is too often forgotten is that the poultry flock is composed of a large number of individuals, the value of each of which may be small but the total owner investment may often be equal to that of a cattle, swine, or sheep owner. It is essential that the total investment in a chicken or turkey flock be considered in determining the source of income.

Selection of a location is important. Again, Doctor Chapman makes a good suggestion when he states that he selected a metropolitan area in the vicinity of feed mills, and a large poultry market. He has developed a practice largely catering to servicemen who call him for help for their customers. Another plan would be to promote hatcherymen as clients to service their supply flocks. Several years ago, I knew a veterinarian who successfully contracted with his clients on a yearly retainer fee basis. Such a plan could include routine vaccinations, periodic inspection of flocks for determination of health status and such routine autopsy service as deemed necessary with emergency calls paid on a call basis. Sexing day-old chicks for hatcherymen, artificial insemination of turkeys and poultry inspection for the local health department are other examples of services to be rendered. Acting as a consultant to feed dealers, hatcherymen and even to poultry equipment dealers is a local service that would be of benefit to the practitioner, the employer, and to the poultrymen in the area.

Group practice for veterinarians probably will become popular in the next few years. This type of practice would be an answer to the need for more and better veterinary service for poultrymen. To manage a poultry practice adequately, a well-equipped laboratory is a necessity, especially if a state supported one is not readily available. A group practice with specialists in various fields could well afford a well staffed and equipped laboratory which would serve all the participants and make better service available to the poultry disease specialist of the group.

An outstanding accomplishment in research of importance to practitioners during the past two decades is the discovery that many of the infectious diseases respond to treatment of the newer drugs discovered by medical research. This is encouraging to the veterinarian who formerly could offer a chicken or turkey raiser little hope of reducing mortality once a disease started in a flock. Also, many of the virus diseases now can be prevented by vaccination. Drugs and vaccines have not replaced good managerial practices but they have become a valuable adjunct and in general can be dispensed with confidence. The almost universal use of antibiotics in poultry feeds and the equally universal trend towards medication of feeds with certain drugs for control of coccidiosis and some other infectious diseases have presented new problems to the practitioner, because of much abuse of the practice. It is important that the practitioner interested in poultry keep abreast of the vast amount of medicated feed propaganda given nowadays to poultrymen in order to give them the best advice on what to accept and what to discard. Keeping a poultryman client properly advised is a way to save him money, gain his confidence and increase the income of the veterinarian.

COMMENTS

The purpose of this article has been to help commemorate the 50th or Golden Anniversary of VETERINARY MEDICINE. It is fitting that a paper on poultry diseases with special reference to avian practice be included in this anniversary issue because its former editor, the late Dr. C. M. Campbell, was a strong supporter of avian research and always urged veterinarians to take more interest in an avian practice.

An attempt has been made to review briefly the progress made in the poultry disease field up to and since the time the forerunner of VETERINARY MEDICINE, *The Iowa-Nebraska Veterinary Bulletin* was started in 1905. Emphasis has been placed on the

scientists who pioneered this field up to and including the early 1920's when poultry research in all its phases really came into its own. I am sure many worthwhile reports of progress, and many outstanding names have been omitted but this has not been intentional. I hope that enough examples have been given to convince readers that the field of poultry diseases was not neglected even in earlier periods. To review the period from 1925 adequately would be impossible in a single article. Examples of accomplishments during the past three decades, include the progress made in pullorum disease eradication; progress in control of histomoniasis and in turkey diseases in general; the eradication of fowl plague on two occasions; the advances made in research on respiratory diseases; the establishment of voluntary federal inspection of dressed poultry in 1929; the inauguration of the National Poultry Improvement Plan in 1935; the establishment of the Federal Cooperative Regional Laboratory for Poultry Research at East Lansing in 1939, and the progress made in research on lymphomatosis as a result of its establishment; the marked advances in development of vaccines for virus diseases; and the discovery of antibiotics and other specific drugs which have aided in controlling many infectious diseases. Included also must be the advances made in genetics, nutrition, and general management practices which have, in turn, done much to aid in the prevention and control of poultry diseases. In spite of all these accomplishments, the annual loss from mortality is estimated at $300,000,000. per year. It must be recognized that during the years of such marked progress, all phases of the poultry industry have expanded in great proportions and new problems have resulted. Research has barely kept abreast. This all indicates that there is much future work for the veterinarian to do to meet the challenge that is being made by the industry.

I firmly believe that there is an opportunity for the practitioner to do a good service to the poultry industry and to earn additional income from his efforts. I have tried to suggest a few methods of approach. As a further aid I have included selected references which are recommended for further reading. Others are included for historical purposes.

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