comments, as they are well known to most of you. It is interesting to know, however, that many of their most valuable accomplishments are due to men like Langmuir and Coolidge, as a result of purely fundamental research, men who, through their work, are known and honored throughout the world.

Arthur D. Little, also one of our past presidents, has done much to advance the chemical industry, with his commercial industrial laboratory, where the work is of the highest scientific order, actuated by all the ideals of the search for truth. Any one visiting the museum in his laboratory can obtain some idea of what he has accomplished, even to the famous silk purse, made from a sow's ear.

I will pass over the organized research departments of the du Pont Company. It was, however, started in the first year of the present century and its growth and accomplishments stand for themselves, so I will leave that for others to comment upon.

The Messrs. Mellon founded the Mellon Institute with a rich endowment. Under the leadership of the present director, Dr. Edward R. Weidlein, its success has been phenomenal. It offers free space and ordinary equipment to any industry wishing to take advantage of its laboratory and organization, for the mere salary of a fellow. It is a non-profit-making institution, but work accomplished there has created or at least started on its way one of the largest and most successful chemical industries in the country and many smaller ones.

I am sure that Dr. Weidlein's leadership and genial personality has had much to do with the success of that institution. The new laboratory of the Mellon Institute, soon to be dedicated, is itself a noble monument to the donors and to industrial research.

It will be impossible to mention all, but such men as F. B. Jewett, organizer of what is, perhaps, the largest industrial laboratory in the world; the late Herbert Dow, who founded and built up a great industry based entirely on research; C. E. K. Mees, of the Eastman Kodak Company; E. C. Sullivan, of the Corning Glass Works, whose research products in glass are so important to the chemist and the cook; George D. McLaughlin, of leather fame; F. C. Kettering, of General Motors Corporation, and others, whom I would like to mention and praise, must be mentioned with the highest respect. Such men were called "industrial explorers" by Maurice Holland, in his work by that title.

Progress can not continue, in this material world of ours, any more than spiritual progress can be attained, without the eternal search for truth, constant endeavor to open the vistas of nature, through, not the work of the individual, but rather by the coordinated work and thought of many.

Love of the beautiful, in nature and art, the love of music, of thought expressed in art and architecture, or in literature and poetry, are the evidences of God in man, and so I feel that the man or woman who devotes his life to the search for truths in nature has the spirit of God in him. It is only by such spirit that we can possibly approach the laws of nature, which has brought order out of chaos in the universe, has made man and given him the power to think.

RELATIONSHIP OF VETERINARY SCIENCE TO ANIMAL BREEDING AND PUBLIC HEALTH—LEGAL PROTECTION OF THE PRACTISE OF VETERINARY SCIENCE.[1] II

By Dr. JOHN R. MOHLER

CHIEF, BUREAU OF ANIMAL INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE

LEGAL PROTECTION OF THE PRACTISE OF VETERINARY SCIENCE

For the extension of its usefulness to humanity in all ways, legal protection of the practise of veterinary science is an important consideration. The advancement of veterinary science in the United States has been measured in large degree by the protection and encouragement afforded through enactment of laws relating to education, practise and civil service.

Being a union of states, our governmental system provides for a distinct division of powers between the federal and state governments. There are, accordingly, certain laws applicable to the country at large and others which are limited in their operation to the confines of individual states. It is the function of our Congress and of state legislatures to enact laws, and while certain acts of our national Congress have been far-reaching in their influence upon the veterinary profession, due credit must be given to the various state legislatures for the helpful laws which they have enacted.

LAWS RELATING TO THE PUBLIC SERVICE

The first legislation in the United States materially affecting veterinarians developed as the result of the existence of contagious pleuropneumonia of cattle.

[1] Address by the president of the Twelfth International Veterinary Congress, Waldorf-Astoria Hotel, New York, N. Y., August 13 to 18, 1934.

This disease, introduced in 1843 with cattle from Europe, had spread along the Atlantic seaboard. While various states had passed laws to deal with the situation, it became evident, if the disease was to be eradicated and our export trade in live stock preserved, that some action by the national government would be necessary. As a result, a law was passed in 1884, just 50 years ago, creating the Bureau of Animal Industry.

This law provided for the appointment of a chief of bureau. It specified that he should be a competent veterinarian. Qualified men were not numerous at that time, but a force was finally organized to cope with contagious pleuropneumonia. On this original force there were 18 veterinarians.

Meat-Inspection Laws

Reference has been made to federal meat inspection in another section of this discussion. Laws relating to the inspection of meats for interstate and foreign shipment, and of live cattle intended for export, were enacted by Congress in 1890 and 1891. These laws were superseded by the present law in 1906.

The effect of these various enactments was to create a further demand for qualified veterinarians, and the then existing small force in the Bureau of Animal Industry was augmented by the addition of men drawn from the practise of their profession.

Until 1894, the educational qualifications of applicants for veterinary positions in the federal service were not fixed. But in that year the appointment of these veterinary inspectors was made subject to Civil Service examination by law which prescribed those qualifications.

It may thus be said that laws administered by the Civil Service Commission have done much to elevate and advance the standards of veterinary education in the United States and, further, to safeguard the profession as a whole against the entry of an inadequately trained personnel.

State Veterinary Schools

The earliest known veterinary school was established in France in 1761. It was nearly 100 years later that the first school appeared in the United States. This is mentioned to emphasize the fact that our struggles here as a profession, from an educational standpoint, were a century behind those of our European colleagues.

Accordingly, some of the first veterinary inspectors in the government service were graduates of veterinary schools of Europe. Others were from the colleges of this country, as the latter began to spring up. These were then few in number. They afforded comparatively short and, for the most part, inadequate courses of study. Many communities were still dependent for veterinary service upon men who had acquired their knowledge solely through practical experience and were without technical training.

The demand for qualified veterinarians in practise and in official positions inevitably became so urgent that the existing veterinary colleges could not supply the requisite number. To fill the growing need numerous private colleges came into existence without uniformity in standards and, in some instances, having a woeful lack of equipment and strongly commercial incentives.

It was at this time that, in various states, laws which became a potent force in correcting this situation were enacted. Veterinary schools were created in conjunction with state universities and agricultural colleges. A federal law now came into existence, providing for financial support of this movement.

It has been felt by some that the association of veterinary schools with agricultural colleges has tended to identify our profession with the science of agriculture when it should more properly be strictly allied with medical science. However this may be, these schools supported by public funds gradually supplanted the privately owned veterinary colleges. There are ten of these state institutions in the United States at the present time, with equipment, faculties and curricula affording a four years' or more intensive study course in veterinary medicine.

This also has tended to protect the field of veterinary science from a loss of prestige which might have resulted had it been necessary to depend upon privately owned schools for the education of veterinary students.

Army Veterinarians

A further aid to our profession has been the passage of laws relating to the establishment of a veterinary corps in the United States Army. Strangely enough, it was not until 1898 that a law was passed limiting candidates for the position of army veterinarians to those who were graduates of a recognized veterinary college, and requiring them to pass a satisfactory examination. The profession then waited more than 20 years for Congress to give adequate recognition to the veterinarian. In 1920 a law reorganizing the Army gave military status to the veterinary corps and provided for gradual promotion to a final rank of colonel.

The influence of this law has been far-reaching. It has done much to establish respect in this country for veterinary science.

Control over Biological Products

Another law which has been a great aid and protection to the practise of veterinary science in the United States is a national law enacted in 1913 for the purpose of controlling the importation and manu-

facture, sale and interstate shipment of viruses, serums, toxins and like products intended for use in the treatment of domestic animals. Biological remedies, as heretofore discussed, when properly prepared are very useful in veterinary medicine. On the other hand, if lacking in potency or if contaminated they may cause great loss to the owner of treated animals and corresponding damage to the reputation of the attending veterinarian. Through regulations of the Secretary of Agriculture, based upon this law, veterinary practitioners are given assurance as to the potency and purity of any biological diagnostic agents and remedies which they may use.

As you well know, present-day means of communication and transportation have multiplied the dangers attending the uncontrolled exchange of viruses, cultures and specimens, not only between laboratories of the different countries, but between those within the same country. Therefore I am suggesting that the responsible directors of all laboratories take such measures as seem necessary to insure that these materials will not be exchanged without approval of the responsible official of the laboratory at the point of origin and the sanitary authorities of the nation or state to which they are consigned. This suggestion is directed especially to those doing research and experimental work with the hope that there will be full cooperation by all such workers to the end that disease may not be accidentally spread to states or localities where they do not now exist. All firms producing veterinary biological products in this country must hold a U. S. veterinary license and none legally may be imported unless the importer holds a U. S. veterinary permit. Rules and regulations have been promulgated for the guidance of domestic producers as well as for the guidance of those who desire to import veterinary biologics into the United States. I am particularly concerned, however, that such products may not be sent to this country from outside laboratories without permission in advance. This concern arises from the fact that not infrequently requests have been received to import materials carrying the causative agents of diseases which are nonexistent here and from the further fact that occasionally such materials have reached our shores without our prior knowledge. I am sure, therefore, that all will appreciate the mutual benefit to be derived from my recommendations.

FOOD AND DRUG ACT

In another portion of this discussion reference has been made to the supplementary informational service of the Food and Drug Administration.

During the past 40 years the United States has built up a series of laws, culminating in the Food and Drug Act of 1906, the purpose of which is to prevent injury to the public through the adulteration or misbranding of foods and drugs, or to prevent buyers from being misled as a result of false claims for a product.

Veterinary remedies are included under this present existing law and, as previously explained, the law is sufficiently broad to require the maintenance of certain standards of strength and purity in pharmaceutical products. Prior to its passage, owners of live stock in the United States had been more or less exploited by certain manufacturers of nostrums who made the most absurd claims for their products. It is no longer lawful, however, to make interstate shipments of drugs or mixtures of drugs labeled as remedies for diseases for which veterinary science recognizes no effective treatment.

Pharmaceutical products are subject to the provisions of this law, relating to accuracy in their compounding. Analysis is the only means by which variation of products from the standard can be determined. As a rule, practising veterinarians are not equipped to make such chemical examinations. Were it not for the control exercised by law in these instances, they would have no assurance that preparations used by them were of the potency indicated on the label. This law, therefore, not only has helped to eliminate in large measure a cheap form of competition which the practising veterinarian formerly met, but it has also given legal assurance to the veterinarian of general dependence upon the quality of pharmaceuticals used by the profession in practise.

THE INSECTICIDE ACT OF 1910

A law, somewhat similar in its purpose and operation to the Food and Drug Act, was enacted by Congress in 1910, relating to insecticides and fungicides. Under authority of this act, the Secretary of Agriculture prescribes regulations designed to prevent the interstate and export shipment of insecticides or fungicides that are adulterated or misbranded. Dips for live stock and also disinfectants as commonly used for premises which have become contaminated with some disease are included under this law.

Here again the veterinary practitioner is assured by law that he can have reasonable confidence in the stability of disinfectants which he may use or recommend for use by his clients, and in the reliability of preparations available in the market for the destruction of parasites, including lice, ticks and mange mites affecting animals.

State Laws Regulating the Practise of Veterinary Medicine

It is probable that of all laws affecting veterinary science in the United States, none have afforded more protection to the profession than those of the various states requiring a license to practise within the state. The District of Columbia and each of our 48 states have laws of this kind, regulating the practise of veterinary medicine. In most of the states those seeking to qualify as practitioners are required to pass an examination. In possibly six states, a diploma from an approved veterinary college is accepted in lieu of the examination. In 31 of the states applicants must be graduates of a veterinary school. In those states where this is not a requirement, the examinations are so rigid that few but college-trained participants can hope to pass the test.

During recent years the spread of veterinary information among live-stock owners throughout the whole country has been marked. This is also true of the rise of general public interest in the subject, especially those diseases communicable to the human family. Live-stock people and the general public, including the millions of owners of dogs and other pet animals, and our growing numbers of poultrymen, have materially increased their veterinary knowledge. They now expect much from our profession.

The standards established by these various federal and state laws, enacted within the last 50 years, have materially helped to confine the practise of veterinary science to men worthy of public confidence.

Summary

Three subjects for many years have received the attention of the veterinary profession. Though seemingly diverse, these subjects—animal breeding, public health and legal protection of veterinary practise—are nevertheless closely related. In fact, they have their origin in a common root deeply embedded in the soil of tradition. They symbolize man's efforts to surmount the risks of his existence on this earth.

Through scientific skill and diligence, veterinary investigators have determined the causes of the principal animal maladies, and scientific literature has given their findings world-wide distribution. In the United States veterinary officials have established both regulatory and informational services in behalf of improved live-stock health. Regulatory measures include a wide range of inspection duties, in connection with the international and interstate movement of live stock, and systematic plans of disease eradication or control. The informational service acquaints owners and practitioners with official recommendations through publications, extension work, radio broadcasting, exhibits and motion pictures.

Quality in live stock is of profound veterinary interest, since animals that are valuable for breeding and utility purposes justify veterinary service more often than inferior types. Surveys have shown that stockmen interested in live stock improvement seek the latest facts concerning means of maintaining animals, including poultry, on a high plane of health and efficiency.

In the relation of veterinary science to public health, meat inspection is an effective barrier to the spread of live-stock infections to man. It also has valuable sanitary features. Veterinary supervision of animals, at time of slaughter, likewise is the basis for an extensive pharmaceutical industry which utilizes glands and other parts of animals for human ailments.

In cooperation with medical officers, veterinarians have aided in improving milk supplies through the establishment of sanitary standards, inspection and tests. These duties also commonly include supervision of general food supplies and of food-handling establishments.

The service of veterinary science to public health suggests other possible applications of knowledge, obtained from live stock, for the betterment of mankind. Promising fields are those of race improvement, nutrition and allied biological studies.

As a result of the unselfish and untiring efforts of those who were members of the profession in former times, and as an outcome of constantly widening public sentiment, with the support of intelligent and cooperative legislators, veterinary science has obtained legal protection comparable in every respect to that enjoyed by other professions in the United States.

The legal protection thus achieved has had an encouraging effect. With this security the profession as a whole has been imbued with higher purpose. It has contributed directly and forcefully to the extension of scientific usefulness in the community, the state and the nation. It has lifted the veterinarian into a vital and indispensable place in the economy of human affairs.

Indeed, legal protection to the practise of veterinary science is a recognized public necessity, in both a national and an international sense, for the reason that the proper distribution and application of veterinary knowledge are world needs.

With such legal protection, broadly speaking, veterinary science has been enabled to find expression through world organization, such as this gathering represents, and which, I trust, may contribute not only to a wider dissemination of veterinary knowledge but to a better understanding of means by which people of all nations may enjoy greater security, prosperity and happiness.