CHAPTER 18

Veterinary Medical Education — A Rapid Revolution ■

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THE HISTORY of veterinary medical education in the United States and Canada formally begins with the sincere but unsuccessful attempts of men like George Dadd to establish the Boston Veterinary Institute, and of Robert Jennings to initiate the Philadephia Veterinary College in the 1850's. The ideas of these men, previously described in this volume, fomented and grew in the minds of scientists, European-educated veterinarians, and legislators until veterinary schools were established in rapid succession from New York to California and from Texas to Montreal.

Compared with the standards achieved by the schools and colleges of the 1960's, the schools of a century ago were primitive and located in livery stables or similar structures in the larger cities. In light of the lack of trained educators, there is little wonder that the schools of the last century were substandard. That the early leaders of the profession were able to influence legislators, and to convince the public of the need for scientific veterinary institutions is no little accomplishment.

Although the French and German influence was present to some degree in the philosophies expounded by the early schools, the greatest influence upon veterinary education in the United States was exerted by the graduates of British schools. As Dr. James Law, a product of Scotland and the first Dean of The New York State Veterinary College at Cornell University, said in 1896:

> As an English speaking people, we have been especially influenced by English example in shaping many of our institutions, and in none more so than in those to which veterinary education has been committed. It has been a crowning glory of the Anglo-Saxon race that they have suspected and frowned upon a too paternal government. In Europe and America, South Africa, Australia, and New Zealand, a prominent aim has been to restrict the functions of government to the protection of the citizen in his personal rights of property and conscience, his lawful business enterprises, and his pursuit of pleasure. Education, it is true, came in for a constantly increasing share of national control and support, but this was mainly along classic lines, and was a legacy which came down to us from the early monastic and ecclesiastical schools. For purely secular education, money was slowly and grudgingly allowed, with a wholesome dread of the evils to be apprehended from class legislation. . . . It is only in recent years that manifest value to the nation, in its competition with other nations, of the highest knowledge and skill in science and arts, has led to the founding and support of technical and professional schools of all kinds, to keep the country in the front of the race of civilization and progress.

In the United States, as in Great Britain, the veterinary schools were private ventures and consequently largely dominated by financial interests. The founders of each of these schools had to answer these crucial questions: Will the venture pay? Can fees be secured to sustain it? Will the name of

the college bring the faculty members greater and more remunerative practice? Will the prospective fees, fame, and practice warrant the investment?

Answers to these questions were necessarily dominated by the question of money. The temptation must have been great to subordinate educational consideration. Pressure was heavy to shorten the curriculum to admit ill-prepared candidates, to graduate large numbers regardless of fitness, and as a final degradation, to sell diplomas.

After the ill-fated attempts to establish veterinary colleges in Boston and in Philadelphia, The New York College of Veterinary Surgeons was chartered in 1857 in New York City by John Busteed, M. D. Although the school was hampered by internal strife, it did a remarkable job for its time, operating almost continuously until 1899. Despite its stormy years and final demise before the beginning of the twentieth century, it is generally regarded as the true progenitor of veterinary education in the United States. According to his contemporaries, Dr. Busteed was entitled to be called "the father of veterinary medicine in this country," since he did more than any other to agitate, popularize, and bring the subject of veterinary medicine before the people and government.

The earliest schools had courses that consisted of two sessions of four months each. Frequently, the work of the second year was a repetition of the first. Students also accompanied the professors on calls in private practices.

Matriculation requirements in the early schools were very flexible. An elementary or grade school diploma was supposed to be required for admission, but maturity and practical experience was usually accepted in lieu of formal scholastic requirements. A prematriculation examination of prospective students was occasionally given.

During the period between 1852 and 1948, thirty-four of the veterinary schools established in the United States and Canada were closed down. Some of these were affiliated with universities which merely discontinued the veterinary curriculum. The former veterinary schools, in order of their establishment, are as follows:

School Name and Location	*Established*	*Closed*	*Graduates*
Veterinary College of Philadelphia	1852	1870	0 [?]
Boston Veterinary Institute	1854	1860	0 [?]
New York College of Veterinary Surgeons, New York City	1857	1899	291
Montreal Veterinary College (Later at McGill University Montreal, Canada)	1866	1903	268
American Veterinary College, New York City	1875	1898	628
Columbia Veterinary College, New York City	1877	1884	80
Northwestern Veterinary College, Minneapolis	1881	1890	3
Harvard University, Boston, Massachusetts	1882	1902	128
Chicago Veterinary College	1883	1920	2387
University of South Carolina	1888	1891	1
Baltimore Veterinary College	1889	1891	1
Detroit Veterinary College	1890	1899	35
Iowa Veterinary College, Des Moines	1890	1894	13
Kansas City Veterinary College	1891	1918	1789
Kentucky State Veterinary College, Lexington	1891	1895	1
Ohio Veterinary College, Cincinnati	1891	1896	67

Indiana Veterinary College, Indianapolis	1892	1924	884
McKillip Veterinary College, Chicago	1892	1920	1212
National Veterinary College, Washington, D.C.	1892	1898	62
United States College of Veterinary Surgeons, Washington, D.C.	1894	1927	419
Queens University, Kingston, Ontario	1895	1899	9
Grand Rapids Veterinary College, Michigan	1897	1918	572
Western Veterinary College, Kansas City, Missouri	1897	1908	178
New York American Veterinary College	1899	1922	187
San Francisco Veterinary College	1899	1918	330
Cincinnati Veterinary College	1900	1920	410
University Veterinary College, Kansas City, Missouri	1902	1906	53
St. Joseph Veterinary College, St. Joseph, Missouri	1905	1923	414
Western Virginia University, Morgantown	1905	1912	4
George Washington University, Washington, D.C.	1908	1918	100
Terre Haute Veterinary College, Terre Haute, Indiana	1909	1918	145
Southwestern Veterinary College, Dallas, Texas	1909	1916	21
Arkansas Veterinary College, Fayetteville	1913	1920	25
Middlesex University Waltham, Massachusetts	1938	1947	243

Of the current schools, the School of Agriculture and Veterinary Science of Mexico established the first course leading to a D.V.M. degree on the North American continent, in 1853. The National School of Veterinary Medicine became an independent facility in 1916. This was followed by the Ontario Veterinary College in Toronto, Canada, in 1862.

During the latter part of the nineteenth century, the private schools flourished. Why then did they become extinct? Whatever had been accomplished in the field of veterinary medicine was the result of personal and individual effort. The government, which in England, France, and Germany was liberal and generous in the support of veterinary science, had done nothing at first for such schools in the United States. Veterinary Science was languishing, not from want of interest but from the lack of funds to conduct experimental research. Bogus diplomas were a problem, as was the lack of entrance requirements, standardized curricula, and licensing examinations. Governmental support of veterinary education was the topic of constant discussion in the veterinary journals.

According to Dr. D. McEachran (1877):

> This profession had too long been left in private hands and private enterprise. If any department of education is deserving of government support and government supervision, this one is. Were it possible to estimate the annual loss to either country [the United States or Canada], owing to the neglect of so valuable an auxiliary to the agriculturist, or the damage done by uneducated quacks, or even by imperfectly educated men holding diplomas, it would arouse the most apathetic, and waken up our governing bodies to an active sense of their negligence.
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> It may not be known either to the public or profession, but it is a fact, that so far as the teaching is concerned, it is anything but profitable, and in too many instances, not only do those on whom the greatest responsibility re-

volves receive no remuneration, but if they are not out of pocket they are fortunate; and too often, instead of being encouraged in their good work, are exposed to the jealousy and ill-will of those whose best interests such institutions must serve most.

Some of the larger universities saw the need for colleges of veterinary medicine just following the Civil War.

In 1868, President Andrew D. White of Cornell University recruited Dr. James Law of Edinburgh, Scotland, to initiate instruction in veterinary medicine. According to Carl F. Becker, in his historical account of the founding of Cornell University (1943):

> While in England, President White triumphantly gobbled up Professor Goldwin Smith and Dr. James Law, a highly recommended young man in the veterinary science. And so he returned, flushed with success and pleased more than a little when it was jocosely said that he had brought back, as a part of his European spoils, an Oxford professor and a Scotch horse doctor.

According to President Andrew D. White's diary, James Law was brought over for a salary of $2,000 until such time that his independent or outside income totaled $500, when his Cornell salary would be reduced in proportion. Dr. Law was educated in the schools of Edinburgh and France. Prior to his coming to Cornell in 1868, he was Professor of Anatomy and Materia Medica in Edinburgh, and Professor of Anatomy in London. Dr. Law established a four-year course leading to the degree of Bachelor of Veterinary Science. Two post-graduate years, followed by a satisfactory examination and thesis were required before the degree of D.V.M. was granted by Cornell University. Although he was highly acclaimed by editorials in the veterinary journals of that time (because of his professional training and his reputation as an author and editor), Dr. Law and Cornell were openly criticized for establishing a veterinary department in Ithaca, rather than in New York City.

As early as 1877, Dr. Law wrote a letter to the *Country Gentleman* regarding the requisites of a veterinary school:

> A veterinary college requires a body of trustees whose position shall be a guarantee of good faith, such an oversight in fact as is now given to our best State and agricultural colleges. It requires a faculty whose attainments are guaranteed not only by public confidence, but by the possession of a degree of one of the best existing veterinary colleges, and if possible by repute for original investigation. It requires that all candidates for admission shall submit to an entrance examination to test their possession of an education sufficient to enable them to pursue their professional studies to advantage. It requires that a very full course of study shall be pursued within its walls before a candidate can present himself for examination in order to the obtaining of a degree. It requires that the degree shall only be awarded after a satisfactory examination at a designated time and place, by a board of examiners apart from the faculty of the college. It requires, finally, a sufficient endowment, so that it may be fully furnished with all the necessary appliances for rendering the instruction lucid and thorough, and to guard against the constant temptation in medical schools to crowd in numbers, irrespective of fitness, and to graduate them at the earliest possible moment, in order to increase the salaries of the teachers.

Although professorships of veterinary medicine were being established in many universities in the United States, Iowa State College was the first to establish a state supported veterinary college (1879). Up until that time, veterinarians were often self-taught or learned what they knew from older practitioners. This paralleled the procedure practiced by physicians. The idea of a truly scientific veterinary college in Ames was conceived by Dr. Milliken Stalker, who had graduated in agriculture in 1873 and had attended the New York College of Veterinary Surgeons and the Toronto Veterinary College. Dr. Stalker became the first dean of a school which shared quarters with the department of botany in the college president's old house. A small bedroom served as laboratory and the front parlor as a lecture room. The president's barn served as the first animal clinic. The course of instruction was two years of nine months each. In light of present requirements and scope of subject material, this seems woefully inadequate. However, at that time, medical schools

generally required two school years of four to six months each.

Dr. Stalker and a physician, Dr. D. S. Fairchild, carried the burden of responsibility for the Division of Veterinary Medicine at Iowa State College from its beginning in 1879 until 1893. House surgeons and nonresident lecturers were changed frequently, but actually did little to relieve the professors of any major responsibility for teaching or research.

NEED FOR RESEARCH RECOGNIZED

The private schools of the era were interested in applied research, but some crusaders visualized the need for basic investigations. In 1878 Dr. J. Arnold of the University Medical College of New York City wrote:

> And now, what can be said of what is being done here in our own land to further scientific medicine or offer inducement to those who are willing to devote their energies to such a noble enterprise? A truthful answer would be of no flattering character, for we shall find that not only the community at large, be they horse doctors or man doctors, either take no interest in these higher studies or being ignorant or indolent, they decry true scientific work because they can see no practical application. This desire for instantaneous, practical results is the damnation of true science; the telegraph, the steam engine were not developed by men of commercial minds, but by those who, seeking diligently for knowledge, which is truth, found the precious treasure, and being pure of heart, gave to their fellow men the results of their labors.

According to Williams (1888), the need for veterinary education at that time was demonstrated by several factors. The American institutions were not producing enough veterinarians to fulfill the needs of the nation. British veterinarians were coming to this country in fairly large numbers. All over the country "scoundrels" were assuming the title of Doctor of Veterinary Science. Stockmen were beginning to realize the need for competent veterinarians. The state and national governments were also realizing the need of qualified veterinarians to fill the ranks of the profession.

In 1888, horses, mules, milk cows, oxen, and other cattle, sheep and swine were valued roughly at $2,236,000,000. This was a very substantial part of the nation's total wealth, and uneducated practitioners could not be trusted with such a responsibility. The leaders of the profession began to look objectively at the country's veterinary colleges. During the late 1800's, it was becoming more and more apparent that increased knowledge of veterinary medicine, improved facilities, and improved methods of teaching were becoming more and more important. The Association of Veterinary Faculties predicted in 1894 that the following things would soon be required universally: entrance examinations, a three-year curriculum, constant use of the microscope, and laboratory knowledge.

Between the years of 1880 and 1900 the number of veterinary schools in the United States increased from three to twenty-five. Most of these schools, however, were of short duration. Of this group, only five are still in existence. The majority of the schools founded around the turn of the century were proprietary in nature. Their primary concern was to produce as many graduates as possible and their standards were not always the best.

During this time, a few leaders were crying out that it was a national disgrace that original research found no home in this country where money could be made. Wealthy men or corporations were willing to find a means for applying the results obtained by scientists in their laboratories. It was also frequently pointed out that the nationality of these scientists was not American. They were generally Europeans.

According to Dr. James Law in 1895, the most accomplished teacher cannot keep fully abreast of the times, unless he is constantly in contact with the "burning questions of the hour," and, therefore:

> it is not enough that we secure the best men as teachers, but we must provide them with the means of maintaining their pre-eminence. The veterinary faculty, therefore, and the laboratory workers should be placed in the closest relation

with every department of sanitary work in the field . . . the ability of teachers in the state college should be constantly stimulated and kept up-to-date, and that students should be provided with the most advanced teaching and the best ocular demonstration.

The eminent scientist is not willing to bury himself where he cannot have the best opportunity for advancement in his specialty. He may decline a chair where this opportunity is restricted, while he would grasp at a position which offered abundant opportunity for investigation and advancement.

The increased recognition of the need for original research to go hand in hand with teaching and practice proved to be the beginning of the end of private schools. Fees could not be raised to a sufficient level to maintain both teaching and research programs.

THE TURN OF THE CENTURY

During the last five years of the nineteenth century, it became evident to many that the short-term private schools were on their way to oblivion. The low national economy at that time, coupled with inadequate preparation of their graduates, helped spell their doom.

Individual veterinarians and their organizations criticized colleges offering D.V.M. degrees in less than three years. A resolution was passed by the Veterinary Medical Association of New Jersey, disapproving the two-year course offered at the National Veterinary College at Washington, D.C. An editor of the *Journal of Comparative Medicine and Veterinary Archives* said that he was certain that those schools which did not come up to the standard demanded by all fair-minded practitioners as absolutely necessary would become extinct. The Iowa Veterinary College, Des Moines, closed five months later.

According to C. A. Cary (1896), it was the duty of every member of the United States Veterinary Medical Association to encourage his respective state to build and equip a state veterinary college and grant no charters to private schools, unless they equal state colleges in faculty, equipment, and course of study. Dr. Cary added that only about one-half of the faculty of the different colleges are fitted to hold the positions which they are in. He disapproved of the common procedure of instructing in a veterinary college, and at the same time maintaining a private practice.

The *Journal of Comparative Medicine and Veterinary Archives* thus editorialized about the closing of the Ohio Veterinary College in 1896:

There can be but one outcome for a long period in the future of such schools, erected on the basis of a money winning investment. They will go into the wall, for the time today required in properly equipping a veterinary practitioner is very different from ten years ago.

Born of no scientific parental love, devoted to no aspects of educational advancement than a business undertaking could create, it dies unlamented and will soon be forgotten with the hope that it will never be resuscitated under such auspices.

Agricultural colleges began playing an important role in the teaching of veterinary science in the late nineteenth century. Twenty-three out of forty-seven agricultural schools had professors of veterinary science who lectured on anatomy, physiology, diseases of farm animals and materia medica. Students were taught how to properly care for animals and how to treat some of the more common ailments. Although some veterinarians thought these departments and their students would be a menace to the profession, time has proved their value, not only in performing the above functions but in carrying on vital research concerned with diseases and the well-being of the nation's livestock.

During the first quarter of the twentieth century, veterinary education was greatly improved. Nearly all the schools adopted three-year programs shortly after the turn of the century. In 1903, a four-year course was initiated at Iowa State College. By the end of World War I, all the schools had converted to the four-year curriculum. Matriculation requirements had changed from a grade school education to a high school education twenty-five years later.

The private schools found it increasingly difficult to compete with tax-supported schools. They began closing one by one, until in 1927 they had completely passed from the American scene. Later one private school, associated with Middlesex University in Massachusetts, operated from 1938 until 1947. It was forced to discontinue operations for many of the same reasons as its predecessors. According to a prediction by Williams in 1900, future veterinary education, reflecting the future of our profession, would be more intensely a part of the university systems, the graduates possessing high attainments, a general education as well as specialized training in surgery, obstetrics, medicine, and other essential subjects.

According to Hagan (1951), the old, private schools were not abandoned without a struggle. They were forced out of existence by advancing educational standards established by state and national governments and by the profession itself. Another fact in the situation was the rapid decline in the number of horses in cities where all of these schools were located, a circumstance which sharply reduced the incomes from private practice. In spite of their shortcomings, these schools generally served a good purpose. They supplied veterinary practitioners, at a time when they were greatly needed, and when no other source of supply was at hand.

During this period, new schools associated with land-grant universities were begun. In addition to those already at Toronto (Ontario), Iowa State College, the University of Pennsylvania, Ohio State University, University of Montreal, Cornell University, and Washington State University, schools were founded in Alabama, Arkansas, Colorado, Georgia, Kansas, Michigan, and Texas. The schools in Arkansas and Georgia remained open for only a few years, but the other five have been in continuous operation. And Georgia was re-established in 1946.

During this period, numerous discrepancies existed among colleges with regard to requirements for a degree. The president of the AVMA stated at the forty-third annual meeting:

> There is no work more important than this Association has taken part in than that of veterinary education — uniform matriculation requirements, uniform curricula, uniform degrees at graduation, uniform state requirements, a license to practice and other problems must be met with suitable solutions.

Realizing the need for standardized education, the AVMA organized the association of faculty and examining boards. It was agreed that little could be done to unify standards except on mutual agreement of all schools concerned. Thus, faculty members from all schools were included.

Attempts were being made during the first decade of the twentieth century to increase entrance requirements, to increase graduation requirements, to increase licensing requirements by examination boards and, as previously mentioned, to standardize all educational requirements. Progress made during this period can be attributed in large part to work by the AVMA, by professional publications such as the *American Veterinary Review,* by local and state professional societies, and by the USDA.

In working with the AVMA and by writing articles in the professional journals, the professional educator greatly influenced the upgrading of the profession. Also, the influence of the BAI of the USDA was felt through published circulars such as: "Report and Recommendations Regarding Veterinary Colleges" and "Regulations Governing Entrance to the Veterinary Inspector Examination." The latter included a list of accredited colleges. This classification of colleges almost immediately became a standard of comparison. Schools not listed were compelled to achieve early accreditation or face extinction. Although some requirements were considered unfair, resulting controversies stimulated introspective examination of veterinary medical education.

One problem of the period was concerned with standardization of degrees of-

fered by veterinary colleges. Although the degree of D.V.M. (Doctor of Veterinary Medicine) was the most common, various schools offered the V.M.D., M.D.V., D.V.S., M.D.C., V.S., Sc.D.V., S.C., and M. V. It was generally felt that the D.V.M. was most appropriate. Although most educators agreed that the title or degree was not as important as the knowledge of veterinary medicine and the ability to use it, uniformity of degrees was still considered a desirable goal.

During the second decade of the century, the necessity for emphasizing *science* as well as *practice* in the veterinary curriculum was recognized. Leaders of the profession publicly proclaimed that the best method for raising the profession to a higher plane was by upgrading the educational institutions. The responsibility of the schools for teaching their students how to prevent the annual multimillion dollar livestock losses was recognized by the public. Legislators appropriated funds for pharmacy and physiological laboratories (new subjects in the curricula), isolation wards, and large hospitals.

Although longer courses and more subjects were popular topics of the time, T. B. Rogers (1914) complained that all student energy was concentrated on receiving passing marks. After comparing the photographic mind with the creative brain, he stated, "Unless enough time is added to the curriculum to allow a more leisurely absorption of knowledge, I do not see that the education of today will give any better results than the education of 40 years ago."

There was a temporary decrease in applications after the standards were raised and the matriculation requirements were made stiffer, but applications increased during the next couple of years. The students who had not been accepted before had gone back to school to pick up the requirements so that they could reapply as soon as possible.

AN ILL WIND

In 1914 an unexpected calamity was largely instrumental for increased interest in the improvement of standards in veterinary education in the United States. The tragic foot-and-mouth disease plague which struck the United States in the summer of that year had a beneficial effect upon the status of veterinary medicine and veterinary education. The first appearance of the disease was among the hogs of a farmer living outside of Niles, Michigan, in August, 1914. By February, 1915, 2,245 premises and 223 counties of 20 states and the District of Columbia had become infected. Since wholesale slaughter of both diseased and exposed animals was considered the best means of controlling contagious diseases, this was carried out on a large scale. Very rapidly, 68,776 cattle, 68,235 hogs, and 9,087 sheep and goats were either slaughtered or died of the disease.

In a presidential address, delivered at the annual meeting of the Ohio State Veterinary Medical Association in January of 1915, Dr. Septimus Sisson declared:

> One of our greatest citizens said not long ago that the American people did not learn so much by experience as by calamities. It is probably true that the recent outbreak of foot and mouth disease, with the attended serious financial losses and dislocation of trade, has done more to bring our profession before the public in a few weeks than all the previous half century of patient and unassuming service.

Several months later Dr. L. C. Kigin, Acting State Veterinarian of Nebraska, realized that:

> The psychological moment is here and if we do not take advantage of the existing opportunity and inform the rank and file and start our march upward, there is one thing sure, we will certainly go on the decline.

Dr. Kigin stressed the need for raising the entrance requirements for veterinary colleges and added:

> I daresay that if the standard of entrance is not given more consideration by veterinary colleges in this country in the very near future it will be a greater hindrance to our advancement and uplift than anything else I know.

A side effect of the increase in interest in veterinary education at this time was

an introduction of short courses for practitioners during the summer by the universities of Minnesota and Pennsylvania and by Iowa State College. These were usually five- to seven-day courses given to help the practitioners keep up with the latest developments in veterinary medicine.

WORLD WAR I

During World War I many veterinarians were employed in the Armed Forces. The number of freshmen enrolled in all veterinary colleges in the country for the year 1917–1918 was 338 against 637 in the preceding year. Due to the scarcity of instructors, as a result of wartime and the excessive work of the veterinarian at home during this period, there was a natural letdown of the educational staff in the veterinary profession.

According to T. P. White, speaking in 1918:

> The graduate of the future must be a trained educator as well as a practitioner; he must be qualified to address public gatherings and have a knowledge of sanitary buildings in public health matters. The profession must expand with balance of world powers and as it appropriates its rightful function in a sphere of science we must look to the individual member to assimilate the necessary knowledge to keep the veterinary problems and ethics abreast of other professions engaged and concerned in making this habitation of man a better place in which to dwell.

Committees were formed in the AVMA pertaining to various phases of professional training. Questionnaires were sent to all veterinary schools in the country requesting detailed information on training programs. Results indicated the lack of competent instructors. There was also a need for uniformity in teaching methods to improve the quality of the final products. An AVMA committee report in 1919 stated that each veterinary college was under profound obligation to furnish education of a high order:

> It must first have capable teachers, adequate equipment and abundant clinical material. If a given college cannot offer such education, it should provide some means whereby students may procure it at another institution, either as undergraduate or postgraduate work.

One of the trends of state institutions was that they invariably were located in small, inland towns and were associated with agricultural schools in relatively isolated communities. In order to get instructors away from the cities, the salaries had to be larger than any state was willing to pay. Another apparent disadvantage of state schools at that time was that the relationship of man and animal diseases was closer in larger cities. Although there were many critics of the establishment of veterinary schools in the country towns, Dr. C. H. Stange went on record saying:

> As far as educating men at state colleges in small cities, I believe we can educate veterinarians for these rural provinces to handle the question – aside from preventing disease among livestock – to more advantage when we have them under those conditions than in any city in which I have been. I want to say the big problems in disease control work in this country are in the agricultural districts and we can train them better in those districts than in any big city.

POSTWAR PERIOD

The period immediately following World War I saw a rebirth of the veterinary profession and the educational process needed to keep it going. According to Dean Eugene Davenport of the University of Illinois, nothing was clearer than that a new era was at hand in respect to education and research within the field of veterinary science. Dr. Davenport said:

> Recent discoveries have thrown new light on the causes of diseases in animals and man, and while they have made treatment more rational than heretofore, they have vastly complicated the subject as a whole. Because of this, the old-time methods and materials of instruction have rapidly become antiquated, and any college which now undertakes to prepare practitioners in this field must be equipped with the best of apparatus and the most skilled of instructors if it is to meet the demands which the public rightfully makes.

The early 1920's saw a decrease in enrollment in the veterinary schools throughout the United States. Although there was

some clamor for lowering of standards, it was generally recognized that if good standards were to be maintained, the better elements would be attracted, as every young man entering the profession would act as a force to attract or repel others. The educational institutions began de-emphasizing the study of the horse and cooperated in more complete studies of all domestic animals and factors related to health and disease. They broadened the curriculum in order to better meet the needs of the times.

By trying to instill a greater awareness and appreciation of the areas relating to animal husbandry, the schools better prepared the future practitioners to be conversant and sympathetic with the problems of the clientele. With such a change on the part of the attitude of the schools, the farmer was less reluctant to seek help from a veterinarian as a specialist in livestock matters.

Dr. J. R. Mohler (1921) saw some of the needs of the future when he said:

> The veterinary schools have the evolution of the medical schools before them as a guide to their own evolution. The medical schools have dropped preparatory courses and now devote their time to professional work. Substantially what has happened in their case will happen in ours.

Postgraduate short courses were organized for many schools and were popular with practitioners. The need for continuing education was becoming more apparent. Veterinary education entered into the realm of service, the beginnings of true professional status. Schools learned to meet the needs of a better education for more qualified students. The instructional needs of the faculty were geared to meet an ever greater obligation. Veterinarians were considered essential to the livelihood of man.

The dependence of man upon animals existed before the beginning of civilization. With the passage of time this dependence was intensified, rather than weakened. There was now definite progress towards the production of better animals and the training of more highly qualified veterinarians to safeguard their health.

It was generally recognized in the early 1920's that one of the most important duties of the profession was to provide adequate teachers for the maintenance and advancement of the profession. Future progress of the profession was realized to be dependent upon the efficiency of the veterinary colleges. Educators promoted research and investigation, resulting in the establishment of experiment stations in every state. Now, one goal of the colleges was to turn out efficient investigators who had the capacity of determining facts resulting from the deductions of carefully planned and accurately executed experiments.

One of the biggest problems facing the educators in the 1920's was the decrease of graduates from veterinary schools, coupled with the decrease of practitioners. The number of graduates from accredited veterinary schools in the United States over a span of years was as follows:

1908: 469	1909: 569	1910: 748
1911: 806	1912: 735	1913: 644
1914: 684	1915: 698	1916: 734
1917: 774	1918: 867	1919: 214
1920: 375	1921: 267	1922: 153

On the average, there were 400 veterinarians retiring every year. There were about 125 to take their places. There were many reasons for the drop in graduates. World War I had been fought, and many men had been drawn from the colleges to go to war. These men would normally have been graduated about 1920, 1921, and 1922. The replacement of the horse by the automobile was certainly a second factor. With job opportunities apparently looking dim, it was not surprising that many young men looked to other professions. But, at the same time, the increasing milk market was raising the rural economic level. Veterinary efficiency was getting higher. Livestock numbers and general economic prosperity were tied together. Little by little, the popularity of veterinary medicine as a career was again taking hold.

The president of the AVMA, Dr. C. H. Stange, addressed the Association in 1924 with the comment that research and education must be depended upon to keep the veterinary profession from lagging behind its sister professions. Other leaders of the profession were saying that no more schools were needed at the time, but the ones that were being established would have to be improved in order to meet the demands of the future. Professors and practitioners alike came to realize that "learning" was a term connected to education outside the college, as well as the time spent in veterinary school.

Although 1924 saw the closing of the last nonuniversity affiliated veterinary institution in the United States, the Indiana Veterinary College, it was also apparent that enrollment in most of the state institutions was low. There was an average of 45 students per college, with Iowa, Michigan, Pennsylvania, New York, Ohio, Colorado, and Kansas having 55 per cent of the 695 veterinary students in the United States.

Educators began to establish publicity programs to interest the public in veterinary medicine. Writing in the *Journal of the American Veterinary Medical Association* in 1924, Dr. R. A. Pearson said, "All veterinarians should be thinking about how they can help interest young men of the very finest type to enter the veterinary profession to fill the depleted ranks." Practitioners also started to put up exhibits at local fairs and gatherings to interest the general public in the profession and in animal diseases.

Dr. Ward Giltner, dean of the veterinary school at Michigan Agricultural College, saw the vital need for research in the veterinary schools (1923) when he said.

> Steps should be taken to provide liberally for further research on the nature of disease. Veterinary education should adequately appraise its responsibility in the matter of training men in curriculo and extracurriculo to serve animal husbandry and, thus, mankind.

More and more veterinarians were beginning to extol the importance of research as the foundation in science. As Dr. S. M. Hayes wrote in the *Journal of the American Veterinary Medical Association* in 1925:

> Research in medicine is the fountain from which the knowledge of etiology, pathology, prevention and treatment of diseases must flow. It is the very foundation of the science. No matter what field a veterinary graduate may follow, he must depend upon the results of research. Progress in every branch of veterinary medicine is dependent upon it, and by it, the profession will reach its height of practical usefulness and its highest recognition as a learned profession.

Also, Dr. Hayes pointed out in the same year:

> Education in veterinary medicine has, and of necessity must continue, to undergo evolution — if we mean by this term growth and development. Knowledge in the field of veterinary medicine has increased faster than it has been possible to change curricula to meet the newer needs of the graduate. It has been necessary to add subjects, and to lay less or greater emphasis upon some that have long been in the curriculum. Our institutions have done well to keep pace, and no censure of inefficiency is here implied. The need for revision of the curriculum is a constant problem.

During the 1925–1926 period there were 13 veterinary colleges in the United States and Canada. These schools maintained a faculty of 130 members at a cost of $871,591. Six of these schools had funds for conducting research programs; other schools were involved in research but had no separate funds established for this purpose.

The problem of a decline in the enrollment in the colleges of veterinary medicine in the United States from approximately 1,300 in 1917 to 500 in 1925 was a major one. The number of men being graduated each year was still less than the number of men lost in the profession by death alone. The problem of insufficient academic material was also great. Most of the veterinary colleges had average enrollments too small to make class work either effective or economic. The very best of them did not boast of being adequately supplied in material, equipment, or staff.

In addition, knowledge in the field of veterinary medicine had increased faster than it was possible to change the curricula and meet the newer powers of the graduate.

THE LOW POINT

Bright young men were not encouraged by practitioners to enter the veterinary profession. The practitioners were pessimistic of the future of their profession because of relatively low incomes, because of the alleged encroachment of municipal, state, and federal veterinarians upon the field of private practice, and because of the unethical activities of some county agricultural agents and high school agricultural teachers. Thus, in the middle 1920's came one of the lowest ebbs in the history of veterinary education in the United States. The general public did not favor improvement in the veterinary educational system in order to accommodate the increasing demands being placed upon the profession. People still had the picture of the veterinarian as a "horse doctor." Consequently, the decreased interest in and use of horses at that time convinced people that the veterinarian was no longer necessary.

Many of the professional men and scholars of this period realized the dire need for an improved system of veterinary education. Dr. Raymond A. Pearson, president of the University of Maryland stated (1927):

> The veterinary profession is necessary for a successful livestock industry. A successful livestock industry is necessary to a successful agriculture. A successful agriculture is necessary to a prosperous nation. The veterinary profession, therefore, is one of the cornerstones underlying national prosperity.

AN UPWARD TREND

With the onset of 1928, student enrollment in American veterinary schools increased to 791. Some expressed the belief that with new openings for veterinarians constantly being created, there would be general improvement for the practitioner in nearly all parts of the country. The outlook for the profession was never better. With this change in outlook, veterinary schools began making strides towards improving their educational programs. They began to train men to use their common sense in the understanding of the nature, distribution, and the control of disease, and to help students to think for themselves and not to merely cram themselves with an inexhaustible supply of facts and theories.

With the disappearance of the horse as the dominant animal in the veterinary profession, the time had come for an intelligent appraisal of the place of veterinary education and practice in the development of the American livestock industry, in the maintenance of a successful and permanent agriculture, and in the preservation of a prosperous and healthy people. The United States had finally reached the point where it was ready to respect, promote, and employ trained veterinarians and to give them the professional recognition and merit they were due.

The recognized schools at that time were all land-grant colleges, with one exception. The student enrollment varied from 9 to 114 students. David White, of Ohio State University, felt that there were three functions of a school at that time: teaching, research, and a source of authoritative information. Schools of the time, however, were deficient in these respects. Many were inadequately equipped and the buildings were not large enough to house the animals nor were they large enough for teaching purposes. Educators felt that teaching staffs at the schools were inadequate for properly educating veterinarians. Some even felt that there were enough fully qualified teachers in the United States to man only one good school. There was a clamor for graduates to work for higher degrees, such as the Ph.D. It was thought that the duty of any graduate planning to go into teaching was to better the standards of the profession. The Committee on Education in the annual meeting of the American Veterinary Medical Association also felt that the major deterring factor in the prog-

ress of veterinary education was the lack of funds.

THE GREAT DEPRESSION

Between 1930 and 1940 veterinary medicine experienced the throes of readjusting to two major economic calamities. First, the disappearance of the horse (and poor educational standards) led to the closing of the proprietary schools. Secondly, the great depression resulted in lower incomes by prospective college students. Relatively few students could afford to go to college. Livestock values during the first half of the decade hardly warranted the services of veterinarians. It was frequently more profitable to allow an animal to die than to have the added expense of a veterinary fee. Because of reduced enrollments and sharply diminished support from state budgets, school funds were severely cut.

In spite of this, major educational advancement was made between 1931 and 1936. Entrance requirements of all the schools were raised to include one year of preprofessional college work. This preprofessional year made it possible to allow more time for such new subjects as Virology, Pharmacology, Nutrition, and Food Hygiene.

Dean C. H. Stange of the Division of Veterinary Medicine at Iowa State College stated in 1930 that the recruiting of staff members was one of the most difficult problems for the veterinary colleges. He proposed three solutions: first, that medical men be brought in as instructors; second, that men from foreign veterinary faculties be added; and third, that people from the field of "pure science" be allowed to work in veterinary education.

During the depression, the largest group of veterinary students had an interest in and experience with livestock. Nearly 46 per cent of the entering students in 1931 were from farms. The rest was largely made up of students whose parents had professional or executive backgrounds. In 1932, two methods of screening prospective veterinary students were established. First, a preveterinary year was required by some schools and, secondly, one school was limiting its enrollment to only the "most qualified applicants." Included in the latter was a careful evaluation of the high school work, especially in the scientific field, and a personal interview.

Along with the gradual increase in students came a number of other problems. As a result of these problems, the AVMA set up a Committee on Education, which studied the various aspects of veterinary education at the time. This committee, which made its first report in 1931, was mainly interested in the quality of the instruction that the student was to receive, but noted that a lack of qualified instructors prevented professors from doing research and writing.

POSTDEPRESSION YEARS

In 1934, there were 1,643 veterinary students enrolled in the ten veterinary colleges in the United States. There was an increase of over 72 per cent in the number of freshmen enrolled as compared with the previous year. The AVMA Committee on Education noted a marked increase in the number of students entering these colleges with college degrees or credits.

In 1935, there was an increase of 332 veterinary students over the enrollment of the previous year. Students were beginning to benefit from many improvements in facilities and by the increased size of the faculty. Among the new improvements appearing at the veterinary colleges were research laboratories, libraries, increased facilities for meat inspection, added facilities for laboratory courses and diagnosis, and laboratories for study of food hygiene. All schools were adding more full-time professors and instructors. Clinic buildings were being enlarged and large animal wards were being added onto the previously small veterinary hospitals.

Requirements for admission to the veterinary schools were becoming stricter. According to W. A. Hagan, dean at the New York State Veterinary College (1936):

> In our system of selected admission, we are considering qualities other than scholastic

ability, although, of course, scholarship is the first requisite. The background of experience with animals is considered, also mental habits and character, as far as they can be determined. All the candidates that are accepted are interviewed, so that their personalities and personal appearance can be judged. Records of mental ability tests often are available, and all that come to us through the New York State College of Agriculture bring with them a farm practice rating, which gives us a fair idea of how much experience they have had with farm animals.

In 1936, the Council on Education of the AVMA defined the necessary curriculum of a veterinary school. The Council's required curriculum included subjects such as Gross Anatomy, Microscopic Anatomy, General, Special, and Post-mortem Anatomy, Bacteriology and Serum Therapy, Pharmacology and Therapeutics, Comparative Physiology, Parasitology, Clinics, Surgery, Medicine, Hygiene and Obstetrics.

During the academic year of 1936–1937, there were 1,968 veterinary students enrolled in United States and Canada. The average freshman class was composed of fifty students. This was from one-half to one-sixth of the number of students that applied for admission. The students that were admitted were selected on the basis of scholarship, motivation, and adaptability. A large share of the students had more than the minimum one year of preveterinary work before applying to veterinary school. Even with the tremendous increase in the number of students, the number of newly graduated veterinarians was still not keeping pace with the decrease in the total number of veterinarians due to death.

During the late 1930's, veterinarians were not only doctoring sick animals but were taking on a large role in the area of public health. In addition to using animals for research on diseases which were transmissible to man, they were the principal guardians for the nation's food supply. The state universities were taking great pains to produce better trained, more scientifically-oriented veterinarians. This stress on the improvement of the scientific nature of the profession greatly changed the public image of the veterinarian.

Due to the upgrading of the profession, the D.V.M. degree was being sought by an unprecedented number of highly qualified students. Since the schools of that time were hardly prepared to handle the new influx, many major problems pertaining to veterinary education arose.

The first problem, of course, was simply that of accommodating a large number of students. The physical facilities of the universities were largely inadequate, but members of the profession could not agree upon whether more veterinary colleges were needed. Many felt that the country needed better veterinarians, not more. However, this problem of too many applicants was really a boon to the profession for admission boards could pick those students who were academically superior and had the highest motivation. The increased selectivity of candidates for admission to the veterinary colleges gave the public a more positive impression of the profession, and it elevated the prestige of the field as a whole.

Secondly, there was difficulty in securing enough adequately trained teachers for the large number of students. There was a scarcity of graduate students in all fields of veterinary medicine. Consequently, many of the universities began extensive graduate programs to stimulate the better students to enter into the fields of research and teaching.

Numerous debates were reported in the literature regarding the desirability of increasing the veterinary curriculum by another year. All schools at this time were on the four-year professional plan. Dr. O. V. Brumley thought that careful admissions would do more to raise the professional standards than increases in matriculation requirements. Dr. Brumley wrote (1938) that a good education was indispensable but of even greater importance was the more fundamental quality of intelligence.

Finally, there were constant problems regarding the curriculum. Curricula were

being modified in schools throughout the United States in order to improve the preparation of the student for his role in the total field of veterinary medicine. Due to the increased importance of the veterinarian in public health, there was a great deal of planning for the inclusion of pertinent subjects in that field. As other fields or disciplines became especially important they were added to curricula.

WORLD WAR II

With the beginning of the fourth decade of the twentieth century, an external force, that of World War II, had an important bearing upon the standards of veterinary education in the United States. Up until that time, scientific research was carried on at a relatively slow pace in the general field of veterinary medicine. With the advent of the war, research in animal diseases turned to methods of prevention. Less emphasis was placed on transportation as this was largely taken over by machinery. However even here, our less mobilized Allies made great use of American veterinarians since they used animal power much more than did the United States. Unlike the situation that prevailed during World War I, the United States Army Veterinary Corps was concerned with communication pigeons, guard dogs, Medical Corps research dogs, and sanitation. Emphasis was placed upon preventive medicine and food hygiene.

Although a portion of the veterinary students dropped out at the beginning of the war to join the Army, the federal government soon realized that veterinarians as well as physicians and dentists were constantly needed to keep up the professional manpower in the United States. Consequently, Army Specialized Training Programs were initiated which allowed veterinary students, as well as those in the other professions, to continue their studies while in uniform. Veterinary students were made aware of the many opportunities existing in the field of veterinary medicine. Careers were opening up in all phases of research, teaching, public health work, and laboratory animal medicine, as well as in specialized practice.

Progress in veterinary medicine during the 1940's was rapid. Public relations had been improved by sound veterinary medical practice, coordination with other professions and service organizations, and the establishment of high standards of veterinary education. The war set up an emergency situation whereby the resources of veterinary education could be tested. The results which were highly favorable, proved to other professions that the education given to veterinary students was on the same level as given to men in other learned professions.

POSTWAR EDUCATIONAL EXPANSION

After World War II, veterinarians were in great demand throughout the United States. Returning veterans wanted to enter upon a course in veterinary training under the G. I. Bill. Many of these men were handicapped by the lack of veterinary schools within their home states. In response to the increased demand for veterinarians and the demand for veterinary education by the returning veterans, seven veterinary schools were founded between the years 1945 and 1948. These schools were established at Tuskegee Institute, the University of Georgia, the University of Missouri, Oklahoma State University, the University of Minnesota, the University of Illinois, and the University of California. Nine years later a new school was founded in Indiana (at Purdue University), bringing the total number of veterinary schools in the United States and Canada to twenty.

The profession continued to grow in depth as well as breadth during this period. By 1949, all schools had extended the preveterinary requirement to two years. As stated by Hagan (1951), "Professional curriculums, highly specialized as they are, are poor substitutes for general education." The trend throughout the United States had now definitely swung to a need for a general education prior to specialized professional training.

THE MODERN PERIOD

Let us take a brief look at the twenty veterinary colleges in operation in the United States and Canada at the beginning of the 1960's.

The first veterinary college to be established in either the United States or Canada was the *Ontario Veterinary College,* established in 1862 by Andrew Smith. In 1908, D. A. A. Grange was appointed principal, and an optional third year was added to the course for the Bachelor of Veterinary Science degree from the University of Toronto. In 1918, Dr. C. D. McGilvray became principal of the college. Four years later, the college was transferred to Guelph in order to effect closer contact with the university and with the livestock industry. Dr. A. L. MacNabb was appointed principal in 1945, and during the next seven years the degree granted was changed from Bachelor of Veterinary Science to Doctor of Veterinary Medicine. Also, the undergraduate course was lengthened to five years, and forty-six acres of land were acquired for a research station. Following Dr. T. Lloyd Jones's appointment to the principalship in 1952, facilities of the Experimental Disease Station were developed and new buildings were added to the college.

Although Cornell University was the first school to have a Professor of Veterinary Science, the *College of Veterinary Medicine of Iowa State University,* established in 1879, is the oldest college of veterinary medicine in the United States. The first dean, Dr. M. Stalker, presided from 1879 until 1900. Since then, the following administrators have been in charge of the activities of the veterinary college: W. H. Beardshear, J. H. McNeil, C. H. Stange, C. Murray, H. D. Bergman, I. A. Merchant, dean of the college from 1952 who retired in 1963 and was succeeded by G. C. Christensen. The college functions in teaching, research, extension, diagnostic service, and clinical service. Research is conducted in all the departments, and its specific research facilities are maintained a mile from the campus. The National Animal Disease Laboratory is located at Ames and provides an opportunity for undergraduate and graduate students as well as faculty members to become familiar with the latest methods of research and the results of that research.

The *University of Pennsylvania's School of Veterinary Medicine* was formally established and opened in 1884. The school traces its orientation and philosophy to Dr. Benjamin Rush, a signer of the Declaration of Independence and a member of the medical faculty at the university. Dr. Rush was the first American physician to hold veterinary medicine as a part of all medicine. It is this concept of "one medicine" which is emphasized today throughout the University's Medical Affairs Division of which the School of Veterinary Medicine is an integral part. Graduate facilities are offered through the school's affiliation with the university's Graduate School of Medicine for advanced study in clinical disciplines and with the Graduate School of Arts and Sciences for continuing education in the basic sciences. In addition to its buildings on the university campus in Philadelphia, the School of Veterinary Medicine owns New Bolton Center, a 320-acre rural medical center in nearby Chester County. The first dean of the school was Dr. Rush S. Huidekoper. He has been followed by John Marshall, Leonard Pearson, Louis Klein, George Dick, Raymond Kelser, and Mark W. Allam.

The *School of Veterinary Medicine of the Province of Quebec, affiliated with the University of Montreal,* is the only French-speaking veterinary school in the Americas. It was founded in Montreal in 1886 by V. T. Daubigny. In 1929 the school moved from Montreal to Oka, Quebec. It was transferred in 1947 to St. Hyacinthe, Quebec. The first building of the new school was erected in 1953. This included administration areas, offices, classrooms, library, basic science laboratories, student quarters, and the research and diagnostic laboratory of the Provincial Health of Animals Service. The requirements for admission to the school at Quebec are the

same as for other schools in North America. Dr. Joseph Dufresne, the current dean, was appointed to that position in 1960.

A school of veterinary medicine offering a D.V.M. degree was established at the *Ohio State University* in 1885. Dr. Henry J. Detmers was appointed Chief. In 1895, the school name was changed to the *College of Veterinary Medicine.* Deans of the college have been Drs. D. S. White, O. V. Brumley, W. R. Hobbs, and W. R. Krill. Since 1950, the college has been gradually relocated to a different area of the Ohio State University campus. New buildings are completed for the teaching of anatomy, bacteriology, preventive medicine, parasitology, physiology, and pharmacology. Added buildings for the teaching of pathology and for animal holding facilities for research and clinics are being completed. In addition to the usual course of instruction, the undergraduate program is unique in that it provides on-the-job training in the fields of public health, regulatory medicine and in the broad field of preventive medicine, in cooperation with state and federal agencies.

Although the *New York State Veterinary College at Cornell University* was established in 1896, veterinary medicine was taught as a subject at Cornell University since its founding in 1868. Dr. James Law, a veterinarian from Scotland, was a member of the very first staff to be gathered at Cornell. He taught the entire veterinary science program from 1868 to 1896. Established in 1894, the College officially began operations in the fall of 1896. Dr. George C. Poppensiek was appointed Dean in 1959. He was preceded in this office by Drs. James Law, Veranus A. Moore, Pierre A. Fish, and William A. Hagan. Because of the growth of the University, the old veterinary campus was vacated in 1957 and the College moved into new quarters.

Courses leading to the professional veterinary degree were first offered at *Washington State University* in 1899. First known as the School of Veterinary Science, the name was changed to *College of Veterinary Medicine* in 1923. Dr. S. B. Nelson served as Dean until 1919. His successors have been D. E. Wegner, R. E. Nichols, J. E. McCoy, and E. C. Stone, (since 1952, but who resigned in 1962 to accept a governmental post. Dr. J. A. McCurdy is acting dean). The original college was moved to new quarters in 1942. In 1960, added clinical space was built.

The *School of Veterinary Medicine at Kansas State University* was formally established as a department in 1905. In 1919 the department became the School of Veterinary Medicine. In recent years, the school has established the Kansas State University Foundation for Veterinary Medicine, which has as its objective the advancement of veterinary science through education and research. Since Dr. E. E. Leasure became Dean in 1948, many new buildings were added to the basic college. Dean Leasure was preceded in office by Drs. F. S. Schoenleber and R. R. Dykstra.

The *School of Veterinary Medicine* at Auburn, Alabama, was established at the *Alabama Polytechnic Institute* (Auburn University) in 1907. In 1949, the school was designated as a regional school by the Board of Trustees in accordance with legislative action taken by Alabama and cooperating states. The first students were admitted under the regional program in the fall of 1949. The program has sponsored almost 300 students since that time. Dr. C. A. Cary served as Dean from the establishment of the school until 1935. He has been succeeded by Dr. I. S. McAdory, Dr. R. S. Sugg, and Dr. J. A. Greene (since 1958).

Founded in 1907, the *College of Veterinary Medicine, Colorado State University,* has been under the leadership of Deans G. H. Glover, I. E. Newson, F. Cross, and R. Jensen. Graduate study toward advanced degrees was initiated in 1925. Physical facilities consist of three academic buildings, an animal reproduction laboratory, and an experimental farm. Off-campus facilities are used primarily in the research program.

A professional program leading to the D.V.M. degree was authorized by the Michigan state legislature in 1909, and the first students were admitted to the *College of Veterinary Medicine at Michigan State University* in 1910. Succeeding the first dean, Dr. Richard P. Lyman, have been F. W. Chamberlain, W. Giltner, C. S. Bryan, C. F. Clark, and W. W. Armistead. In addition to its veterinary curriculum, the College also enrolls approximately 130 students annually in its Medical Technology curriculum. During the past years, greater emphasis has been increasingly placed on research and graduate study.

The *School of Veterinary Medicine at A. & M. College of Texas* was formally initiated in 1916 under the leadership of Dr. Mark Francis. The school occupied a new physical plant in 1955, located on a 270-acre tract of land, adjacent to the main university campus. Dr. A. A. Price was appointed Dean in 1957. In addition to Dean Francis, he was preceded in office by R. P. Marsteller, R. C. Dunn, I. B. Boughton, and W. W. Armistead.

Established in 1944, and advanced to professional college status in 1957, the *College of Veterinary Medicine at the University of Illinois* has not only expanded and improved its professional training program, but has expanded and integrated its research and graduate program with the clinical, diagnostic and extension activities directly serving the Illinois animal industry. With the Illinois Department of Agriculture, it jointly operates the Diagnostic Laboratory, offering students an opportunity for extensive training in diagnostic procedures. The first dean, Dr. Robert Graham, was succeeded in 1956 by Dr. Carl A. Brandly.

Tuskegee Institute's School of Veterinary Medicine (Alabama) was established in 1945 as a direct outgrowth of the shift of emphasis on southern agriculture and the increased need for veterinary services. Dedicated in 1950, the School of Veterinary Medicine is permanently housed in six buildings, which provide facilities for instruction in all phases of veterinary medicine. Since 1949 the school has been a regional service institution, cooperating with the Southern Region Education Board in ten southern states, accepting students from these states on a quota basis. Deans of the School of Veterinary Medicine at Tuskegee Institute have been Dr. F. B. Evans, Dr. F. D. Patterson, and Dr. T. S. Williams.

The *University of Georgia School of Veterinary Medicine* was established by the University Board of Regents in August, 1946. Dr. Thomas J. Jones became Dean in 1947. The first class of students was graduated in 1950. The professional curriculum of the School of Veterinary Medicine is slanted toward developing well-trained, competent practitioners with emphasis on high scholastic achievement. All professional veterinary classes are housed in the School of Veterinary Medicine building, completed in 1953.

The study of veterinary medicine at the *University of Minnesota* began in 1947 with the establishment of a school of veterinary medicine on the St. Paul campus as a part of the Institute of Agriculture. In 1957, the school was designated the *College of Veterinary Medicine*. Dr. W. L. Boyd was the first Director of the School of Veterinary Medicine. Since 1952 administrators have been Dr. M. H. Roepke, Dr. H. C. H. Kernkamp, and, as of July, 1954, Dean W. T. S. Thorp. The clinic building, the first to be constructed for the College, was completed in 1951. Preclinical quarters were constructed in 1954, and additional buildings were completed in 1959. New diagnostic and animal isolation quarters were finished in 1960 and additional facilities have been approved as part of a continuing expansion program. Many of the current research programs are conducted in cooperation with members of the College of Medical Sciences and the Institute of Agriculture.

The *College of Veterinary Medicine at Oklahoma State University* was organized in 1947 from the Department of Veterinary Science. The first class of the College of Veterinary Medicine was graduated in 1951. The College of Veterinary Medicine at Oklahoma is a regional school serving

Oklahoma and contract states under the Southern Regional Education Board. Dr. Glen C. Holm was appointed Dean in 1956. He was preceded by Dr. C. H. McElroy and Dr. Harry W. Orr.

Dr. C. M. Haring, Head of the Division of Veterinary Science at the *University of California* for over forty years, was the first dean of the *School of Veterinary Medicine* established at Davis, California. Dr. George H. Hart succeeded Dr. Haring in 1948, the year the first class was admitted. Following Dr. Hart's retirement in 1954, Dr. Donald E. Jasper was appointed Dean, and he was succeeded in 1962 by Dr. W. R. Pritchard. In addition to the professional program, an extensive graduate training program is carried out in virtually all areas of veterinary medicine. A research farm is maintained about one mile away from the central campus for livestock experiments. Isolation units are available in addition to pastures, corrals, and other barns and buildings.

Although veterinary medicine has been taught at the *University of Missouri* since 1885, the *School of Veterinary Medicine* was first established in 1946. Dr. A. J. Durant, the first Dean of the school, was appointed in the same year, and was succeeded in 1949 by Dr. A. H. Groth, who retired in 1963 and was succeeded by Dr. B. W. Kingrey. In addition to new buildings on the campus, a ninety acre farm has facilities for the animal disease research program.

The newest veterinary school in the United States is the *School of Veterinary Science and Medicine at Purdue University* (Indiana) which was established in 1957. The school admitted its first class of students in the fall of 1959. Dr. L. M. Hutchings, former Head of the Department of Veterinary Science, served as Dean from 1957 until his death in July, 1959. Dr. E. V. Morse was appointed Dean in 1960. The buildings housing the teaching, research, clinical, and service facilities of the new school occupy a 34-acre plot on the main campus of the university. In addition, the school maintains a 360-acre research farm. As is the case with many of the older schools, Purdue University not only offers a professional curriculum leading to a D.V.M. degree, but has graduate programs leading to the M.S. and Ph.D. degrees in each of the four academic departments.

The twenty veterinary schools in operation in the United States and Canada had a student enrollment of 4,008 in 1961. Of the 1,104 first-year veterinary students, 55 had five years, 214 had four years, 301 had three years, and 443 had two years of preprofessional work. A total of 210 first-year students have advanced degrees. In addition, veterinarians engaged in graduate study at veterinary schools total 403. The increasing demand for veterinary education, as evidenced by the number of professional and graduate students in the veterinary schools during the 1961–1962 academic year, is resulting in a broader but yet more detailed professional curriculum as well as a more comprehensive graduate training program throughout the entire United States and Canada.

The earliest schools of veterinary medicine had unlimited freedom in the scope of their curriculum, the number of professors, and plans of studies. The need for standardization of requirements led to a system of self-government employed by the profession in the form of a Council on Education as part of the AVMA. The aims and purposes of the Council, as stated and approved by the House of Representatives of the American Veterinary Medical Association in 1956, are to promote active progress in veterinary medical education in the various schools and colleges with full accreditation of them as the ultimate goal.

In fulfilling this function the Council encourages and assists schools to meet requirements. Upon request, the Council considers evaluation of newly established schools making accreditation possible at the time of graduation of the first class. The Council outlines means and methods for progressive improvement of veterinary medical education. It requires the correlation of scientific knowledge, clinical experience, procedures, and techniques of

veterinary medical education and the socio-economic conditions of the times. It strives to establish and apply criteria for the accreditation of schools and colleges which offer courses leading to a degree in veterinary medicine, including admission requirements, undergraduate curricula, research programs, and graduate training in veterinary medicine. It periodically publishes the accreditation status of the schools and colleges and establishes standards of proficiency by correlating all the activities associated with veterinary medical education. It studies methods of teaching in veterinary medical schools with the objective of progressive improvement and, finally, it constantly studies the needs for establishing courses that will enable veterinarians to meet changing demands.

In light of the present demands for comprehensive instruction on the professional and graduate school level, the Council recommends that members of any veterinary medical faculty should have adequate academic qualifications. These qualifications include general and special training. Research activities and contributions to original knowledge are important criteria in evaluating the faculty and school. It looks for evidence of a balanced program of teaching and research when the faculty is considered as a whole. It recommends that the policy of faculty recruitment recognize the need in professional education to seek personnel specifically qualified for teaching.

With the proper policing of professional veterinary education by members of its own ranks, veterinary medical education has reached the highest point in its history. Specialization on the part of veterinary medical faculties, as well as AVMA requirements, has drastically changed the over-all picture of veterinary education in the United States. Specialty organizations, such as the American Association of Veterinary Anatomists, the American Association of Veterinary Bacteriologists, the American Society of Veterinary Physiologists and Pharmacologists, the American College of Veterinary Toxicologists, the American Veterinary Radiology Society, the American College of Veterinary Pathologists, the American Association of Veterinary Nutritionists, the American Association of Equine Practitioners, and the American Association of Zoo Veterinarians, among others, have been highly effective instruments in encouraging teachers and research workers within specific disciplines to exchange information regarding instructional and investigative techniques. This had not only led to more uniformity in the standards of veterinary medical education throughout the country, but has increased productivity in the ever-enlarging research program.

Cooperative research between scientists in all disciplines of veterinary medicine with scientists in allied disciplines, such as Biochemistry, Pharmacology, Radiology, and in all departments of medical schools, led to an increased awareness on the part of the Doctor of Medicine and the Doctor of Veterinary Medicine about the role that each can play in furthering and advancing knowledge regarding both animal and human health. Research programs sponsored by such agencies as the National Institutes of Health, the National Science Foundation, and the Rockefeller Foundation, to name a few, have been highly productive in the obtaining of knowledge regarding basic information concerning cardiology, neurological diseases, arthritic conditions, digestive disorders, and many other syndromes of animals. This information has, in turn, become invaluable in the hands of physicians who apply this knowledge to the care of the human being.

A LOOK TO THE FUTURE

Our colleges and universities are faced with exceedingly complex problems in determining the direction that veterinary medical education should take during the next few decades. A century ago, an educator's main concern was to train his students to diagnose and treat ailments of the horse. As rural economy was strengthened, the task of the graduate veterinarian encompassed the care of all farm animals. As urban conditions improved, the vet-

erinarian became responsible for the health of pet animals.

Although veterinarians worked for governmental agencies such as the Bureau of Animal Industry in the United States Department of Agriculture and the military services, an overwhelming majority of students prior to World War I trained to become private practitioners, usually on their own or occasionally in a partnership. They looked forward to being rugged individualists.

During the 1940's and 1950's, careers opened up to veterinarians in numerous health fields. The increase in educational requirements to include at least six years of university work helped to broaden horizons. The public demand for the knowledge and skills possessed by the Doctor of Veterinary Medicine forced him to respond to the necessity of adapting his practice according to changing agricultural economics. He acquired or renewed skills that enabled him to take his rightful place in all forms of medical research and in public health administration.

Currently, the demand for graduate veterinarians in the United States far exceeds the supply. "Career recruitment" has become recognized as not only necessary, but vital, if the need for veterinarians is to be met. The AVMA and state professional associations are encouraging the establishment of programs to interest well-qualified and highly motivated students to seek veterinary medicine as a career. Guidance counselors in high schools and colleges are helping to direct both rural and urban youth to the potential careers available to people possessing professional veterinary training. Parents are becoming aware of the possibilities for their children in this field. Practitioners and veterinary research workers are striving diligently to interest talented youth to look toward careers in veterinary medicine by visits to high schools, talks before service clubs and civic groups, and by helping with the work of the Boy Scouts, 4-H Clubs, and the Future Farmers of America.

This increased need for veterinarians in the United States cannot be met by merely adding more schools of veterinary medicine or by crowding more students into each of the present schools. Without doubt, new schools will be added in more states. The present programs would suffer if too much crowding were to take place. However, the changing need for veterinary skills must first be assessed and curricula adapted accordingly.

Although a year-round crash program was followed during World War II in all veterinary, medical, and dental schools, it was universally acknowledged as being unsatisfactory. Students had little time for the digestion of facts and data. Professors had no time for research, writing, and evaluation of their course offerings. It is conceivable that well-planned trimester or all-year quarter systems may be utilized to increase the number of veterinary graduates. These will, of course, necessitate larger faculties and staffs in order to permit professors to pursue original investigations, write textbooks and research papers, and have the opportunity to keep their teaching programs ahead of changing needs.

Summer clinical programs are being utilized by a few schools to give students more clinical experience before graduation. Given in the summer between the third and fourth professional years, these programs are proving to be very successful and it is anticipated that more schools will follow suit.

Future concern about veterinary medical education is as much involved with the emphasis placed upon various areas of the curricula as it is with the number of hours a student has in contact with his instructors. Should there be minor or even drastic changes in the traditional pattern of veterinary professional education? Should there be an increase in time needed for preprofessional training? Should specialty training be emphasized or encouraged on a post-doctoral level? Should greater emphasis be placed upon graduate programs leading to Master of Science or Doctor of Philosophy degrees? Are we in danger of allowing interest in research distract from sound teaching?

These questions must be evaluated and carefully answered if the veterinary profession is to fulfill is mission for the remainder of the twentieth century.

There is little evidence that a three- or four-year preprofessional curriculum is seriously being contemplated by current schools. However, a large number of students in each class have three or more years of college training prior to admission. The opportunity to receive both Bachelor of Science and Doctor of Veterinary Medicine degrees by spending an extra year in college is encouraging some students to voluntarily increase their preveterinary training (in addition to, or in lieu of, the B.S. degree now awarded by most schools at the end of the second professional year).

The four-year professional programs are being examined by universities in light of the current and future demands upon their graduates. In addition to practice, students look forward to careers in research, teaching, the armed forces, commercial activities, laboratory animal care, and government service.

The changing agricultural economy is forcing the farmer to consolidate. The small family farm is rapidly becoming a thing of the past. The gathering together of huge herds or flocks is not only leading to increased problems in disease prevention and control, but is forcing the veterinary schools to train their students in disease prevention, herd management, and economics.

The increased transportation of animals by air from one country to another is requiring more instruction in exotic diseases and in diseases transmissible from animals to man. In the future, the graduate veterinarian will play even more of a vital role in public health matters.

The need for more detailed knowledge in surgery and diagnosis, as well as in the basic disciplines of anatomy, physiology, pathology, microbiology, and nutrition, is responsible for the increased popularity of group practices. Veterinary medical education must adapt to this situation without substantially increasing the length of time required for a person to receive his D.V.M. degree. The current trend is for institutions to offer specialized training on a postgraduate level — in the form of interneships, residencies, specialty training and graduate instruction leading to advanced degrees. This appears to be a significant trend for the future.

The formation of specialty groups or associations has led and will continue to lead to improved standards in veterinary medical education. Most groups meet to work out solutions to mutual problems concerning nomenclature, research, and professional and graduate training (American Association of Veterinary Anatomists, American Society of Veterinary Physiologists and Pharmacologists, American Association of Veterinary Bacteriologists, American College of Veterinary Toxicologists, American Veterinary Radiology Society, American Association of Veterinary Nutritionists). Other groups (American College of Veterinary Pathologists, Animal Care Panel) also require examinations and certification as membership criteria. Certification by the American College of Veterinary Pathologists, for example, indicates that the person is highly qualified to perform a large number of clinical-pathological tests and is experienced in pathological diagnosis. Certification, however, is no indication of research training or ability.

Graduate training (offering research training) leading to the Master of Science or Doctor of Philosophy degrees is offered by departments within many veterinary schools. The scope of this type of program is almost certain to increase rapidly. The close association of teaching and research programs makes graduate training beyond the D.V.M. degree highly desirable in all subject areas, with the possible exception of clinical medicine and surgery. It is anticipated that certification will be established for clinical areas during the coming years and that prospective clinicians will be interning at universities in order to qualify for the examinations.

Cooperative research with medical schools, medical research institutes, and

agricultural research institutes will continue to broaden and take more of the veterinary professions' time. A recent editorial in the *Journal of the American Medical Association* (January 13, 1962) emphasizes the similarity between the training and goals of the M.D. and the D.V.M. It is pointed out that:

> human and veterinary medicine are being drawn closer and closer together in the basic sciences to gain maximum health for man, pets, and farm animals. There is a peculiar paradox in the fields of research and clinical medicine: the studies undertaken in a small group of animals may save the lives of a million men and, contrarily, a surgical technique developed primarily for man may become applicable for the treatment of many animals. This emphasizes the quandary for those who would question the value of research in fields that seem at first visionary and unproductive.

It appears certain that veterinary medical education of the future will not only be concerned with keeping professional curricula abreast of the times or with postgraduate training, but also with so-called "service" teaching. The veterinary science departments have long been responsible for teaching the fundamentals of anatomy, physiology, and sanitation to agricultural students. Many of the veterinary medical schools have continued this service, with worthwhile results. Present trends indicate that veterinary schools will have more and more responsibility in the organization of medical technology programs; in the teaching of biological subjects to engineers (in preparation for cooperative research programs in bio-engineering); in the teaching of physiology to pharmacy students; in the teaching of comparative anatomy to agricultural and medical students, and in the teaching of neurology to psychologists and bio-electronic engineers. This trend has not diluted professional educational programs nor has it detracted appreciably from research and clinical activities. It has, however, been of decided service to other disciplines and, at the same time, broadened the horizons of veterinary medical education.

The costs of veterinary medical education in the future will be high, both to the student and to the state. In Pennsylvania, for example, the legislature provided $2,800 per medical student and $3,200 per veterinary student for 1962. There is no doubt that education involving high expenditures for facilities and equipment as well as high ratios of instructors to students will continue to be expensive. It is more and more apparent that state legislatures are recognizing the need for many more Doctors of Veterinary Medicine in the future and are willing to pay the bill.

A summation of veterinary medical education in the United States, past, present, and future, might best be expressed in the words of an editorial written in the *Journal of the American Medical Association* (January, 1962):

> The schools of medicine and veterinary medicine recognized for many years, long before the ascendancy of medical education and experimental medicine, that their house should be put in order. The problems were deep-rooted and not easily composed. Students were still sitting on hard benches, listening to dry lectures, taking notes on the cuff, and working in dark, dingy laboratories. Those were the days of cram sessions and the medical primer. Then, through successive moves the long, tiresome lectures gave way to demonstrations and clinical clerkships. Laboratories and operating rooms for fundamental investigation are becoming the equivalent of the surgical amphitheatre. Indeed, the facilities for experimental surgery and biological analyses as well as the curriculum of [veterinary] medical education have set a pattern for other academic pursuits, and progress continues day after day.

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