

# University of Ceylon Review

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## *The Progress of Veterinary Science\**

IT is my pleasant duty first of all to express my appreciation of the honour conferred on me by the University of Ceylon in appointing me the first Professor of Veterinary Science in Ceylon; secondly to express my appreciation of the establishment of a Faculty of Veterinary Science. It is true that this Faculty does not yet function as a separate Faculty but as the number of students increase veterinary affairs in the University will necessitate the attention of an active Faculty Board.

The mention of veterinary students leads me to mention that I was astonished to learn when I arrived last year that Veterinary Science did not appear at all popular in Ceylon as a career, the more so as the Veterinary Colleges of the British Isles are full, and have a waiting list of entrants for two years ahead. I understand that in all other countries of the world there is a similar state of affairs. The immediate cause of the unwillingness of Ceylon youth to enter Veterinary Science is the present poor salary scale paid by the Government and this in turn is a reflection of the low estimate of the value of animal husbandry and of the importance of animal health in Ceylon.

As was pointed out in the report of the Milk Committee of 1944 the consumption of milk in Ceylon is about the lowest in the World, less than 2 ounces per head of the population. This means that many millions of children, expectant mothers, and nursing mothers never taste fresh milk, surely a deplorable state of affairs. The explanations for this low consumption of milk are many but the principal one is the high cost of good fresh milk and in turn one of the explanations of the high cost is the low individual production of the cows of Ceylon. The reasons for the low production lie in breeding and feeding. A high percentage of the cows of Ceylon evidently do not pay for their keep, poor though that is: better cows must be bred and fed so as to produce more milk. They must also be protected against the common diseases that lead to premature death, low fertility, and poor productivity. Here is a great field for the veterinarian in Ceylon; he will have problems peculiar to Ceylon but he can benefit from the immense accumulation of knowledge garnered in all the other countries of the world, not only from our veterinary predecessors and contemporaries but from medical physicians and surgeons, physiologists,

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bio-chemists, pathologists, bacteriologists, protozoologists, helminthologists, agriculturists of all countries, all of whom contribute some quota of fresh knowledge which may be useful in promoting animal health. It is the duty of the University to provide the means of access to this knowledge and the duty of the teacher to educate the student that he will make full use of the knowledge and, if possible, add to it.

The veterinary art is probably as old as the custom of keeping domesticated animals. It has been estimated that man domesticated the dog about 7000 B.C., i.e. almost 9000 years ago, the ox about 4000 B.C., the ass, buffalo, sheep, goat and pig about 3000 B.C. There are records of these animals being used in Egypt and Mesopotamia in those eras. Later about 2000 B.C. geese, ducks, pigeons, cranes and cats were domesticated. The camel was used in Arabia and Mesopotamia about 3000 B.C. but there is no mention of it in Egypt until 300 B.C. The horse came from Persia to Mesopotamia about 2000 B.C. and later to Egypt and Syria. It soon replaced the ass in the pulling of war chariots but was not used in the form of cavalry until the 7th century B.C. From that time until as recently as the 1st world war 1914-1918 the horse was all important in war; it would take too long to make only brief references to instances of the importance of the horse in war but it has been said that one of the causes of the breakdown of Napoleon's Grande Armée on its retreat from Moscow was the outbreak of glanders in his horses.

In the ancient civilisations of the East, surgical treatment of horses, cattle, camels and other animals was fostered and reached a high degree of skill and honour. As might be expected in countries influenced by Buddhism, with its tenets of the sacredness of animal life, the art of veterinary medicine was highly developed in ancient India and in Ceylon. Thus it is recorded that king Buddhadasa cured a horse and a cobra. Similarly in Babylonian civilisation, the Hammarabi C. 1800 B.C. record the activities of veterinarians and stipulate the fees to be paid. The veterinary art was transmitted to the Arabs and the Greeks. Unfortunately, it would appear that with the rise of Christianity in Europe, there was a corresponding disinclination to attend to the ailments of animals. It is my opinion that the explanation of the degradation of animals and of the science of treatment of animal disease in the early years of the Christian era is not as simple as certain veterinary historians make out. The Church certainly continually preached that man has an immortal soul and that animals have not souls; in addition there was probably constant warfare against animism and the ancient religions of Egypt and Rome with their worship of bulls and dog faced gods. Thus the earlier Christians possibly developed an aversion to handling sick animals. Christianity derives much from Judaism and as we know, the Jews abhorred the eating of all animals save the cloven hoofed ruminants. The Mosaic prohibitions have been continued to this day in Judaism and in the religion of Mahomet. The pig is held in horror and the dog is despised.

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In the earlier centuries and indeed up to the 16th century, in Western Europe, interest in diseases of animals was confined probably to the ailments and injuries which occur in the war horse. The men who treated the war horses were known as Marshalls and might be regarded as precursors of the modern veterinarian. Up to the end of the 18th century and indeed for a good part of the 19th century, little interest was taken in animals other than horses. Indeed it is probable that apart from the epizootic diseases of rinderpest, contagious bovine pleuro-pneumonia and foot and mouth, there was little disease in the original breeds of cattle of the British Isles. With the advent of the Industrial Revolution and consequent rise in population, there was in England a demand for more cattle to supply meat and milk. The pioneers in animal breeding such as Bakewell developed their better strains and improved breeds. The pioneers of the new methods of agriculture, e.g. rotational cropping, showed how cattle could be fed over the long winter and need not be slaughtered in autumn in order to provide pickled meat. Incidentally it ought to be mentioned that this centuries old practice of living on pickled meat throughout the northern winter led to the earliest trade with the East. There was a constant demand for spices to flavour the otherwise in-appetising food, and of course, then as now, the lands of the East, principally Ceylon, were the sources of supply.

With the increase of the horse and cattle population, there appeared the diseases which spread easily among crowded communities, the epizootic bacterial, protozoal and virus diseases. Rinderpest and foot and mouth disease spread across Europe from Russia or perhaps India. Contagious pleuro-pneumonia became established in the cattle, glanders in the horses. Later still, with the crowding of more and more milking cows into insanitary cowsheds and the increasing strain put on cows to produce milk and especially to produce milk in the winter, tuberculosis gained a firm foothold in the cattle of Northern Europe.

Schools for the training of veterinary surgeons had been established in the 18th century in France and in Germany and at the end of the 18th century (1792) the Royal Veterinary College of London was founded, the first Principal being the French veterinary surgeon, Sainbel.

Sainbel was a man of high ideals but unfortunately he died of glanders soon after coming to London and was succeeded by a medical man named Coleman who had the strange opinion that the less educated a young man was, the better veterinarian he would make. Thus for many years the popular conception of a veterinarian was an uncouth fellow with no culture and less manners. However there were many eminent cultured and gifted veterinary practitioners in the 19th century. Some of them had been educated abroad in France and Italy. A notable example was Gamgee who agitated constantly for the control of the epizootic diseases and for prohibition of indiscriminate

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importation of cattle from abroad. His ideas on the spread of disease and methods of controls were much in advance of his time.

Later in the 19th century, veterinary schools were established in Edinburgh, then in Glasgow, later in Liverpool and in Dublin, i.e. 5 in British Isles. There are 3 in France, 2 in Belgium, 2 in Canada and 1 in Holland, Norway, Sweden, Denmark, Australia, South Africa. There were 5 in Germany before the war. It might be remarked that the development of veterinary education in the British Isles was due mainly to private enterprise or with the aid of the agricultural community. It received little or no support from the Government, unlike the veterinary schools of many countries on the continent of Europe.

Just before the outbreak of the last world war the British Government set up a committee to enquire into veterinary education. The reason for this commission was that a big programme for the eradication of disease in the cattle of Great Britain was contemplated, the benefits derived from veterinary research were obvious; more and better trained veterinarians were required; the crying needs of the developing African colonies included a demand for veterinary services. The Loveday Committee decided that two more veterinary schools were required and that these and existing schools should be incorporated in universities. The two new veterinary schools were established about a year ago in the Universities of Cambridge and Bristol; the Royal Veterinary College of London is to become part of the University of London, the Royal (Dick), Veterinary College to be part of Edinburgh University, the school at Liverpool has been part of the University of Liverpool almost since it began, Glasgow veterinary college is to be incorporated in the University of Glasgow. The Veterinary College of Ireland has been given a Veterinary Faculty in the National University of Ireland.

The Council of the Royal College of Veterinary Surgeons established by Royal Charter in 1846 and re-strengthened by later Act of Parliament (1881) has been augmented and remains the governing body of the veterinary profession in the British Isles exercising jurisdiction over all veterinarians in these countries even in the Republic of Ireland. When Ireland achieved her independence, in 1922, friendly conversations between members of the Council and leaders of the new government in Ireland led to an admirable compromise between national aspirations and professional solidarity. An Irish Veterinary Council was established and this Council acknowledged the jurisdiction of the parent council in London to which it sends delegates even after the declaration of a Republic. The Council of the R.C.V.S. also has jurisdiction over the standard of education and of examinations.

Within the last few months the re-constituted Council of the Royal College of Veterinary Surgeons has met. It is no longer composed solely of veterinarians elected by ballot of the members of the R.C.V.S. at home and abroad;

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it has additional members, six nominated by the Privy Council and also two from each of the Universities in which the veterinary schools are established ; one of each pair must be veterinary surgeons. This new council has granted full recognition of holders of veterinary degrees taken in the University of Sydney and the University of Pretoria, i.e. veterinarians holding those degrees who come to the British Isles are put on the register of the Royal College of Veterinary Surgeons and are allowed to practice and to vote in election for Council. The recognition of other veterinary degrees granted in different universities in the world undoubtedly will follow, provided the courses provided and the standard of teaching and examination is approved by the Royal College of Veterinary Surgeons.

The minimum length of the course for the M.R.C.V.S. is 5 years, the first year being the pre-veterinary year for the basic science subjects of Chemistry, Physics, Botany and Zoology ; in most Universities these subjects are taken along with medical students. Thus undergraduates with the Higher School Certificate and having taken those subjects may be exempted from the 1st year. Anatomy and Physiology occupy the second and third years and during this time the subjects of Histology, Embryology, Animal Husbandry, Animal Management, and Pharmacy are also followed. In the 4th year, the subjects of Pathology (which includes Bacteriology and Protozoology) and Parasitology are taken. Lectures in Medicine and Surgery are begun and are continued throughout the 5th or Final Year ; in the Final Year, Meat and Milk Inspection, Veterinary Jurisprudence and Sanitary Law are also studied.

The courses followed at other veterinary colleges in the world are very similar in those establishments where 5 years at least is spent on veterinary education. Indeed at some veterinary school in European countries, e.g. in Holland, the course is spread over 6 years. I might remark here that the syllabus for the Degree in Veterinary Science of the University of Ceylon will follow that of the R.C.V.S. as closely as possible. Naturally certain diseases of animals more important in Ceylon than in the British Isles will have more attention paid to them and conversely some of those more important in the British Isles but not important in Ceylon will be less extensively dealt with.

After this brief sketch of veterinary education, I should like to make a short review of the progress of veterinary research and control of disease in animals.

Soon after the early work of Pasteur and his colleagues in France and of Koch and his pupils in Germany, there was accomplished a great deal of research on the major diseases of animals. The investigations into the causes of tuberculosis and glanders was followed by the discoveries of the specific allergic reactions to the heat stable products of the growth of the tubercle and glanders bacteria and thus the tuberculin and mallein tests were devised. By the end of the 19th century, glanders in horses in the British Isles was being

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eradicated; extensive application of the tuberculin test is being made only now, but in the U.S.A. the tuberculin test has enabled many states to eradicate tuberculosis of cattle.

In the case of the epizootic diseases caused by viruses and the virus like organism of pleuro-pneumonia of cattle the problem was to devise effective and safe as well as economical methods of control.

In the British Isles, the policy advocated by Gamgee and other prominent veterinarians *viz.* extermination of infected animals and of those which had been in contact, together with prohibition of the importation of cattle from abroad soon yielded good results. Rinderpest, contagious bovine pleuro-pneumonia, sheep-pox have not been seen in the British Isles for over 60 years. Foot and mouth disease remains a menace as the virus can be carried on inanimate objects and by migrating birds but the "slaughter out policy" is considered to be the most expeditious and economical method of controlling this disease; this policy is also followed by the U.S.A., Canada and by the Scandinavian countries. However, the control of epizootics by this method is not economic or even possible in some countries; thus, India and the extensive colonies and mandated territories in Africa are invaded repeatedly by waves of rinderpest, etc. From the early days of Koch's investigations various vaccines have been tried with greater or lesser success but it would appear that the most effective is that devised by Dr. J. T. Edwards formerly Director of the Imperial Research Laboratories in Muktesar, North India. Edwards found that rinderpest virus could be passaged through goats and that after a certain number of passages, it became almost non-pathogenic for cattle but was still antigenic, i.e. stimulated immunity.

Edward's goat virus vaccine has been applied successfully in dozens of countries and has saved millions of cattle from the ravages of rinderpest. About the same time, the German veterinary research workers devised an effective vaccine against foot and mouth disease; this vaccine is comparatively expensive to produce but it is worth using in good dairy cattle. Research on the virus of foot and mouth continues in England, Germany and Argentina.

Apart from the epizootic virus diseases, the major diseases of cattle in Europe and possibly in most other countries, are tuberculosis, contagious abortion or Brucellosis, mastitis, Johnes disease and diseases causing sterility or infertility. Excluding tuberculosis, the cost of these conditions in Great Britain alone has been estimated at £20 million annually.

Contagious abortion is being combatted in two ways (1) by building up herds free from infection, every animal being submitted to the agglutination test, (2) by vaccination with the live but avirulent strain 19 vaccine. Mastitis caused by streptococci and staphylococci is being controlled by the use of the sulphur drugs, penicillin and the newer antiseptics. Johnes disease is a slow insidious infection of the bowels with bacteria closely related to the tubercle

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bacillus ; a vaccine is being tried out in the field at present but it will be many years before its value can be assessed. A great campaign against sterility or infertility was begun about the beginning of the last war. The very complicated endocrine gland system is being studied, the effect of various natural and synthetic hormones investigated. Artificial insemination is being developed on a large scale ; using this procedure prevents diseases being conveyed from the bull and also eliminates the use of inferior bulls, thus raising the general standard of the cattle population. Artificial insemination is being used on a very extensive scale in most countries of the world, particularly in Russia and the U.S.A. In the British Isles, all A. 1. stations must be in charge of a veterinarian whose duty is to examine the donor bulls, examine cows for the cause of infertility and treat such cows. The actual inseminators are trained technicians.

Mineral deficiencies, vitamin deficiencies, poisoning by minerals and by plants have been investigated in many countries during the past 30 to 40 years. We have known for a long time that iron was an essential element for blood formation and this knowledge has been used for the prevention of anaemia in young pigs. More recently Australian and British veterinary research workers found that copper was an essential element for the proper development and function of the blood and nervous system. Congenital ataxia or Sway back of lambs can be prevented by allowing the ewes access during gestation to salt licks containing copper. Another essential element is cobalt. If there is lack of cobalt in the diet, sheep and cattle develop anaemia and become emaciated. For the development of healthy bones the diet must contain calcium and phosphorus in definite proportions to each other. Lack of phosphorus leads to rickets. This condition was common in cattle on the veldts of South Africa and in Australia and Texas ; the affected animals became lame and developed a depraved appetite for decomposing bones ; these bones, often contained a powerful bacterial poison, the toxin of the botulinus bacillus and thus the cattle developed botulism. The condition was investigated by the late Sir Arnold Theiler and his colleagues at the Veterinary Research Laboratories of South Africa. Treatment of the pastures with phosphates and feeding of bone meal to the cattle was shown to prevent the disease.

Other minerals which have been found to be essential to animal health are magnesium and manganese. The dramatic effects of hypo-calcaemia, i.e. lack of calcium in the blood and of hypo-magnesaemia lack of magnesium in the blood and on the nervous system and endocrine glands of cattle are now well known ; the equally dramatic effects of injecting suitable solutions of salts of these elements are also familiar to every veterinarian.

In the extensive field of vitamin research, veterinarians have played a prominent part ; avitaminoses are not uncommon among domestic animals. Even in surgery, great progress has been made ; diagnosis made or confirmed

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by X'ray is an everyday occurrence in the clinics of the veterinary colleges and of practitioners. The newer methods of setting fractured bones have been adopted by many veterinary surgeons. It is impossible to give more than a brief sketch of the activities of the veterinary profession. It is sufficient to say that it can claim to be doing its duty in (a) preventing disease, (b) curing disease and relieving suffering, (c) preventing the spread of diseases communicable to man, (d) improving the food supply of the human population, (e) carrying out research which is beneficial not only to animals but also to man.

In conclusion I wish to affirm the aims and ambitions of the Faculty of Veterinary Science in the University of Ceylon. These are :—

- (1) to provide a sound education in Veterinary Science, equal to that given at any other school in the world.
- (2) to encourage post-graduate training and research.
- (3) to co-operate in its campaign for improvement of animal husbandry with the Government of Ceylon and with any public body and any associations which have as their objects the improvement of animal husbandry, the prevention of disease in animals and the alleviation of suffering in animals.
- (4) to play its part in achieving the ideals of the veterinary profession of Ceylon ; those are unity, co-operation, progress, integrity. It is my firm belief that these aims can be achieved only by goodwill on the part of all ; the Government by improving the condition and salaries of their veterinary officers, the public by recognising the value of the veterinarian in saving animal life and alleviating suffering and the veterinarians themselves by recognising the importance of unity, co-operation and progress. It is my fervent hope that soon we shall see these ideals achieved and that the veterinary profession in Ceylon will continue to advance in honour and prosperity.

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