

WHAT IS A VETERINARIAN?

PART II

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Detailed discussion of the veterinarian's role in an intraprofessional team should not obscure the truth that the veterinarian's occupation is essentially a private enterprise one in which he is himself both morally and financially responsible. Almost one-half of Canada's veterinarians operate private practices, 10% of graduates being engaged in small animal work and 40% in general practice. The veterinarian in private practice is the first recourse of Canada's livestock and pet owners when illness strikes. He alone may capably treat sick and injured animals, issue health certificates permitting transportation and export of animals, and prescribe dietary and sanitation measures to keep animals healthy. It should be noted that in addition to livestock, many animals and birds, both indigenous and exotic, are kept for recreational purposes. These also provide companionship for man. Their value cannot be measured in monetary terms but their health and their well-being is the responsibility of the veterinary practitioner.

The responsibility for the diagnosis of an animal disease rests with the private practitioner. He is the one man in the community who, by statutory regulation and through a sense of personal motivation, is "on location" with the equipment and the necessary knowledge to prevent animal diseases during such times as his energies are not detracted by the more immediate demand to fight its hazards. Education, immunization, and treatment are his weapons. Located at strategic points throughout the country, he is in the vanguard of the profession, exercising as he does a night and day vigil to ensure the maintenance of a prosperous livestock industry. He often stands alone—the one man on the spot—whose judgement may avoid or precipitate a national calamity.

Within this context, then, it is perhaps understandable that leaders in organized veterinary medicine are "vigorously opposed to governmental encroachment upon our right to practice veterinary medicine freely and independently" (1).

Traditionally, however, large spheres of governmental action have, during the past century, paralleled the development of this private practice. This phase of the veterinarian's work, sometimes referred to as "regulatory service", now commands our interest. It is a sphere of governmental activity which the private practitioner has welcomed, even actively encouraged and assisted, in recognition of the truth that there are many functions in regard to prevention, control, and the eradication of animal diseases which the individual practitioner cannot perform. These include control of wild animal vectors of livestock diseases, the carelessness of individual farmers, the provision of uniform food and sanitation inspection service and, in the face of mechanized transport by land, sea, and air, the controls necessary to prevent the introduction into the country of exotic

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diseases. Nothing short of strict and uncompromising initiative by central governments could, under such conditions, be tolerated.

Thus it happens that of 2,300 veterinarians in Canada, approximately 30% are employed by Federal, provincial, or municipal agencies. One-quarter of our veterinarians are employed in the Health of Animals Division of the Canada Department of Agriculture. In this capacity the veterinarian may be required to administer and carry out disease control and eradication programmes on specific diseases like Foot-and-Mouth, hog cholera, and rabies; he may provide meat inspection services in abattoirs; and do tests, diagnoses, and fundamental research on disease. He may find himself at work on the race track, inspecting animals or livestock products on board cargo ships, or condemning milk or the use of chipped restaurant china in his capacity as a municipal public health officer.

That he is engaged in valuable pursuits may be surmised from the report of the Gordon Commission (2) which, in 1957, predicted that Canada's 1.3 billion livestock industry would double by 1981. This was perhaps a cautious estimate; already in 1962 it approximates 2 billion. It is perhaps a justifiable source of pride to Canadian veterinarians that two illustrious forebears pioneered the work in North America of this unique Federal service. They include Duncan McNab McEachran who, in 1873, established the first quarantine station at Fort Levis opposite Quebec City (3), and J. G. Rutherford (4) to whose knowledge of epidemiology and whose administrative skill this modern Health of Animals Division is a tribute.

Turning from general to more specific illustrations, we might consider the work of veterinarians in this Federal service on such diseases as Foot-and-Mouth and brucellosis.

Foot-and-Mouth is an extremely infectious disease and it is believed necessary, at least based on present knowledge, to slaughter animals in contact with the disease in order to reduce risk of further spread. Many, even including those who were most seriously affected by this slaughter policy during the Saskatchewan outbreak some years ago, take the matter so much for granted as to ask "what is unique about Canada's policy?" They fail to understand that most nations have resigned themselves to the necessity of living with the disease. Vaccination programmes in such countries as Germany, Belgium, France and Italy fail to check new outbreaks. Britain annually loses approximately £600,000 to the disease. On February 13, 1961, the Chief Veterinary Officer of the United Kingdom reported 283 outbreaks from November 6 to February 12 and reported the slaughter of 68,023 animals for which farmers were compensated in the amount of £2 million. Professor Ramon, Director of the International Office of Epizootics, who studied Foot-and-Mouth statistics for the years 1955-6, gave it as his view that the methods employed by Canada's veterinarians appear to be the best available.

In 1957 and before full-scale implementation of a national brucellosis control programme, Canada was losing \$9 million per year to that disease and recently, within a few short months, an outbreak of hog cholera in Quebec and Ontario necessitated the slaughter of some 18,000 hogs for which a total compensation of \$590,300 was paid to farmers. In the United States where an attempt is made to live with this disease, it costs approximately \$50 million annually or \$1.00 for

each hog that goes to market as against 2½ cents per marketed hog in Canada (5). While it is true to say that in the matter of regulatory service the Canadian veterinarian benefits from numerous advantages including a northern climate, a sparse population, manageable frontiers, and a political constitution which emphasizes Federal rather than regional powers, nevertheless these illustrations serve to indicate what it means to be a veterinarian with the Health of Animals Division in the Canada Department of Agriculture.

It will be evident that many of the diseases which fall within the purview of the Health of Animals Division are referred to as "zoonoses", a word which serves to highlight the complex interaction of the veterinarian's work with agricultural and medical services as illustrated previously (figure 2, Can. Vet. Jour. 3: 216). When in 1959 the Expert Committee on Zoonoses set out to redefine "zoonoses", they found it expedient to substitute the single word "between" for such words as "anthropo-zoonoses" and "zoo-anthroposes" and the definition now reads "those diseases and infections which are naturally transmitted *between* vertebrate animals and man" (6). The disease entities include tuberculosis, Q fever, anthrax, psittacosis, hydatidosis, plague, rabies, brucellosis, and leptospirosis, there being more than 100 recognized zoonoses in which domesticated and wild animal reservoirs are sources of greatest danger to man. To study the veterinarian's role in this area is to shift one's reference ever so imperceptibly from that of agriculture and animal science to medicine by way of the public health disciplines. Taking account of Canada's vast Northern hinterland, a work like Dr. A. McDiarmid's *Diseases of Free-living Wild Animals* (7) will indicate dramatically the avenues of public service which lay open to the veterinarian in Canada.

The Expert Committee on Zoonoses stresses the need for collaboration and free exchange of information on animal and human diseases, the financing of disease-control campaigns, improved food-hygiene services, and the need for mutual assistance between countries throughout the world in epidemiological work. Indirectly, they all but define the veterinarian as more than a key professional in the agricultural-medical complex; they make something of an international agent of him:

To integrate the efforts of public-health and agricultural authorities, a development in recent years has been the establishing of veterinary public-health units in many countries, usually within the organizational framework of municipal, district, or federal departments of health. These units act as the bridge connecting public-health and agricultural resources and interests, and serve to synthesize the attack on the various problems of concern to each group (8).

This takes cognizance only of the epidemiological aspect relating to diseases which are transmitted to man; to consider the veterinarian's responsibility in a world whose population threatens continually to outstrip its food supply is to take an additional measure of his international sphere of influence. In a recent report, Dean W. W. Armistead of the College of Veterinary Medicine, Michigan State university noted that protein foods (particularly animal products which are important to disease resistance) are the scarcest foods of all wherever people are starving. In his opinion, "a little meat in the diet of millions who now get none at all would eliminate more human disease than could 1,000 heroic medical missionaries".

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The amplitude of this problem is rendered even more critical because of a world shortage of veterinarians which now calls for international action. Dr. K. V. L. Kestevan, F.A.O. Director of Animal Production has noted that

... in Britain there is one veterinarian for every 30 square miles; in the United States the ratio is one to 270 square miles; in South Africa it is one to 1,700 square miles; in Canada it is one to 1,900 square miles; but in East Africa, the ratio stands at one veterinarian to 5,000 square miles (9).

It will not be surprising to learn that veterinarians hold membership in numerous international organizations including F.A.O., W.H.O. and other United Nations agencies including U.N.E.S.C.O. They hold membership in the Pan American Sanitary Bureau, the Foreign Agricultural Service, and the World Veterinary Association which, in 1963, celebrates its centenary under the name "World Animal Health Year". Canada's part in one of these, the International Office of Epizootics is perhaps worthy of separate notice inasmuch as the United States is not a member nation and Canada's representative, Veterinary Director General Dr. K. F. Wells, recently took a stand the direct result of which had issue in a meeting of the Chief Veterinary Officers of the Commonwealth in London from September 11-14 this year. Delegates are attempting to resolve the problem that a world crisis in veterinary education imposes.

Significantly, also, Canadian veterinarians helped to initiate plans for the World Food Programme (now known as the World Food Bank) in a twenty-nation intergovernmental committee which subsequently won approval in U.N.E.S.C.O. Canada has pledged \$5 million of which one-third will be in cash and, if pledges are sufficient, administrative and operational machinery will be set up with headquarters in Rome very soon.

From this discussion on Public Health and its international ramifications it is but an easy step to consider the veterinarian's contribution to medicine. Again, the two seem inextricably interwoven and threaten always to merge one with the other. It is not without cause that Dr. H. J. Stafseth finds it "difficult to decide when medicine is strictly human and when it is strictly veterinary medicine" (10). Even the most cursory study will expose the layman's view that "when medicine is applied to humans, it is human medicine and when applied to animals it is veterinary medicine," because clearly the principles supporting the basic sciences of physiology, pharmacology, microbiology, immunology, and pathology, are common to both. The work of these two professions has been mutually inter-dependant down through the ages but we can now see that

... William Jenner's demonstration (in 1796) that cowpox protects against smallpox was, indeed, revolutionary. The distinction between human and animal was no longer tenable so far as medicine was concerned (11).

The world is not wanting for examples of effective collaboration between the medical and veterinary professions. Recently Dr. R. Ian Macdonald had occasion to note that "through the astute clinical observations and imagination" of a practicing veterinarian in Canada, opportunity was provided to investigate dogs with a peculiar bleeding disorder. These dogs were found to be suffering a disease condition which was clinically indistinguishable from classical haemo-

philia and which now bears the name "Christmas Disease". Dr. Macdonald continued:

We now have another expendable experimental tool, thanks to the fact that . . . (a veterinarian) in practice knew that he didn't know the basis of the dog's illness and, as well, he had a healthy bump of curiosity and the determination to get to the root of the trouble. The cross-fertilization of ideas is to be encouraged when the aims of the two disciplines of the healing art coincide and especially when a team effort seems more likely to produce useful results more quickly than could otherwise be the case (12).

Modern space medicine provides yet another area in which the veterinarian may play a large part on that team which necessarily interests itself with matters pertaining to national survival. Here the veterinarian's role is only part of a larger one which is to provide healthy, uniform laboratory animals which are indispensable to biomedical research. The laboratory animal industry in North America alone has an estimated value of approximately \$300 million. Sound extrapolation of data on animals requires an intimate knowledge of the animals themselves which can only come from veterinary science (13).

In a letter recently to the Canada Department of Agriculture, Dr. G. J. Wherrett, executive secretary of the Canadian Tuberculosis Association stated that

. . . since the inception of a very excellent programme for the control of bovine tuberculosis by the Department of Agriculture and the extensive pasteurization programme throughout Canada, bovine tuberculosis has been practically eliminated as a cause of the disease in man (14).

Comparative medicine is another area in which human and veterinary medicine are so inextricably involved "that they may be profitably considered together" (15).

The close inter-relationships of the veterinary and medical professions should not, however, obscure the truth that veterinary medicine is not organized as a specialty branch of medicine. It is a unique, self-governing profession which adheres to its own code of ethics and moral law. Further, it has its own system of education, of enabling legislation and licensure, and it has its own professional organizations at local, county, federal, and international levels.

It is impossible, within the limited scope of this paper, to deal separately with every area of activity which directly or indirectly involves the veterinarian. By way of conclusion we shall deal briefly with the matter of his potential role in civil defense and, more extensively, with his professional obligations to scientific agriculture.

It has long been recognized that the basic training in the medical sciences which the veterinarian possesses can and does serve as a foundation for advanced training in medicine itself or for specialized training in such disciplines as pathology, radiology, physiology and public health either on a full-time or emergency basis. Future military conflicts might well involve civilian casualties in numbers far surpassing the capacity of existing medical services to meet the emergency. The veterinarian's potential contribution has been amply recognized in numerous blue-prints for national survival in reference to such matters as food inspection, range management, water pollution, detection of biological agents,

radioactivity, and the effect of chemical agents. In the words of Dr. E. E. Ballantyne, Chairman of the Civil Defence Committee of the C.V.M.A., the veterinarian will be required, in the event of nuclear attack, to fill a paramedical role to supplement Emergency Health Services (16).

The Canada Department of Agriculture has recently, for example, named Dr. R. V. L. Walker as a Training Officer with special reference to biological warfare and his work will be co-ordinated with emergency measures within the Department of National Health and Welfare, the Health of Animals Division, and the Defense Research Board of Canada. Veterinarians within the civil defense organization would make it their objective to reduce casualties, to confine damage, to restore order, to provide emergency relief, and to rehabilitate, re-establish, or replace the facilities needed to serve the population.

The relationship of the veterinarian to the agricultural scientist has, perhaps unavoidably, been implied throughout this paper. Some few specific terms of reference are nevertheless called for by way of conclusion.

In 1957 the Gordon Commission on Canada's Economic Prospects stated that by 1965 Canada's population would increase by 25% and that an 18% rise in per capita income would create a demand for one quarter more meat, eggs and poultry than they consumed in 1935-9. By 1980 overall livestock output per improved acre would rise by 90% over the 1955 level. That the veterinarian is a key figure in this coming expansion may be assumed from our knowledge that in 1960 Canada's livestock was valued at approximately \$2 billion (17) which means that the share for every veterinarian in Canada today, regardless of his type of work, will approximate \$750,000.

During recent months the world has again been shocked by resurrected Malthusian doctrines which purport to show that human populations will outstrip available food supplies. At such times it is necessary to recall Professor A. L. Banks' comment that

... if much of the loss from disease is capable of being prevented we need not worry unduly about the world food situation for a long time to come, for the control of the great animal plagues in tropical and sub-tropical countries should produce results as remarkable as those following the control of malaria in human beings (18).

In any event it seems clear that changes in agricultural economic patterns such as contract farming and large feeding operations will necessitate modifications within the veterinary profession. If the number of practising veterinarians cannot be increased in linear relationship with animal populations, then contract veterinary services would seem to be indicated. Such a trend is already apparent with the formation of group practices which include small and large animal practitioners, specialists in swine, sheep, or poultry and, quite often, specific disease specialists. Such group practices offer clinical and laboratory diagnostic services and facilities to effect eradication or preventive programmes on a herd or flock basis. It was perhaps inevitable from the beginning—though the truth has been a long while "a-borning", that this team of veterinary specialists should include also an animal husbandry graduate (19).

Inclusion of the professional agriculturalist in such a team would seem to bring our wheel (figure 2, *Can. Vet. Jour.* 3: 216) full-circle and it might seem appro-

priate to conclude with a reference to a teamed agricultural research experiment undertaken some years ago on the Guelph campus under the name "Manitoulin Island Project". This project amply demonstrates that the veterinarian can no longer emulate the rugged individualism of his forebears; it illustrates in uncompromising fashion that to be a veterinarian in 1962 is to be a person whose every professional gesture will involve him in a reciprocal interchange of knowledge and skills whose boundaries are limited only by his own unwillingness to grow.

In the summer of 1956 Mr. W. T. Abraham, the Agriculture Representative for Manitoulin Island called to the attention of Dr. S. I. Morrison, local veterinarian, the general unthriftiness of cattle in the area. Dr. W. R. Mitchell, Veterinary Extension Officer of the Ontario Veterinary College was called to visit the area and within weeks a committee consisting of Dr. H. D. Branion, Head of the Department of Nutrition of the Ontario Agricultural College, Dr. J. A. Henderson, Head of the Department of Medicine and Surgery, O.V.C., and Dr. W. R. Mitchell were presenting to Mr. E. I. McLoughry of the Agriculture Extension Branch what was surmised to be a nutritional disease problem of Manitoulin Island cattle. Following a preliminary study which included a visit by the group to the Island, a co-operative research and demonstration project was set up on seven farms. A mineral mixture, formulated by the Department of Nutrition, was supplied to all farms and, on four of these, a complete farm management programme was instituted.

Long before the project has reached this stage, however, it had become evident that in whatever direction the experts turned on the Island, they encountered unexplored and unanswered questions; a committee which started with four men had grown, by the next year, to include representatives from some twelve departments and divisions of the campus. The Department of Soil Science conducted soil tests and made fertilizer and management recommendations. Lack of proper drainage was a major problem affecting soil productivity and the Department of Agricultural Engineering and Specialists of the Agricultural Engineering Service of the Extension Branch of the Ontario Department of Agriculture made drainage recommendations and supervised demonstrations. The Department of Field Husbandry recommended pasture and hay mixtures as well as grain varieties. The Department of Agricultural Economics supervised and checked farm inventories and accounts so that the economic value of the recommendations would be known. The Department of Nutrition analyzed hay and grain samples each year in order to indicate to the farmer any change in the nutritive value of his home-grown feeds. The Extension Services of the Ontario Veterinary College supervised the health of the livestock always vigilant to control complicating diseases or "side-effects" of experimental feeding which might spoil the project as a nutritional study. By 1958, for example, Dr. N. A. Fish of O.V.C. was on the scene to investigate and check an outbreak of vibriosis and the project had advanced so far as to encourage the recommendation by Dr. W. R. Mitchell of a breeding programme to permit selection of animals more capable of utilizing efficiently the available food resources on the Island. The Extension Branch of the Ontario Department of Agriculture assumed costs of the entire project wherever necessary.

The project, of five years' duration, has now concluded (20). It has been a

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success in that it demonstrated clearly that lack of sufficient feed and a mineral deficiency were at the root of the Island's agricultural problems. The project not only increased the income of farmers who co-operated in the pilot study but it has served as a demonstration to all farmers on the Island of the possibilities for improvement. It is perhaps more than significant that even before the experimental project had concluded, success was being registered in directions hardly anticipated five years earlier by the original committee of four. For example, Dr. W. R. Mitchell was able to report that though the project had concerned itself mainly with beef cattle, herd conditions on the Island had so far improved as to have affected the milk market at Elliot Lake; further, it rejuvenated a sheep promotional programme on the Island.

This, then, is the figure of our veterinarian in 1962—albeit the picture is necessarily limited and incomplete. Nevertheless, it may serve to underline the paradox of modern science which is that persons engaged in specialized fields continue to find more and more areas at the outer edges of their research which overlap one another. It is clear that the illustration which the Manitoulin Island Project offers might be applied, in slightly modified terms, to the private veterinary practitioner, the veterinary species specialist, the veterinary educator, the veterinary extension worker, and the veterinarian in our civil and military services. Each one of these persons daily finds it necessary, within a network of other disciplines, to make his contribution—or not at all. He has this also in common with persons in other professions: he must develop a strong sense of personal initiative and identity and then, perhaps anomalously, he must be prepared to refine out of existence his very Self.

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BOOK REVIEW

The Veterinary Annual. Third Issue. Edited by W. A. Pool, John Wright and Sons Ltd., Bristol. 1961. 42 shillings.

Like its predecessors this volume is essentially a literature review, mainly of articles appearing in 1960, along with nine special articles of general interest. Of the latter, an article on "programmed practice" under the title of "The Ecological Approach to Veterinary Medicine in the U.S.A." should be of the greatest interest to Canadian veterinarians concerned with large animal practice.

The review section does not attempt to cover all aspects of veterinary science reported on during the year and some of the reviews could be expanded with profit. Nevertheless an enormous amount of material has been condensed in usable form and this series represents a most valuable addition to veterinary literature. *J. A. Henderson.*

ABSTRACT

"Cardiovascular Disease in Horses." By W. C. MILLER, Vet. Rec. Vol. 74 No. 30, 825-828. 1962.

This paper was presented as part of a symposium on Cardiovascular disease at a meeting of the Central Veterinary Society on April 5, 1962.

The author reports lesions of parasitic origin, arteriosclerosis ("atheroma") and atherosclerosis, valvular lesions and abnormalities and idiopathic progressive atrial degeneration. He emphasizes that it is impossible to over-stress the importance of lesions in the heart and blood vessels resulting from direct and indirect damage caused by parasitic worm larvae.

The work of Mahaffey and Cooper is reported briefly. Arteriosclerotic changes leading to extensive medial and intimal calcification occur in horses of all ages but more predominantly in older horses. Environmental conditions do not appear to have any influence on the development of these lesions. Fatty changes and atherosclerosis have been described.

In addition to developmental abnormalities of the valves small hematoma-like lesions are occasionally found in aortic valves of horses which have suffered clinically from cardiac embarrassment. Massive vegetations such as those observed in swine after erysipelas have not been found in horses.

Idiopathic progressive atrial degeneration is encountered in aged or aging thoroughbred stallions in which progressive degeneration of the atrial myocardium is seen. The author postulates on the pathogenesis of the lesion. *H.C.R.*