



Is the veterinary profession losing its way?

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Introduction

Present circumstances and some lessons of history lead me to believe that the strength of our veterinary profession is being sapped by our lack of flexibility to adjust both the nature and the competence of our profession to keep pace with changes in society and the biological environment. We are drifting down an increasingly constricted path that will squander much of our future potential to serve society.

In the following, I discuss why I believe this is so and what we might do about it, and I draw upon comparisons with the professions of medicine and engineering, which have had to adapt to many of the same challenges faced by veterinary medicine. In particular, I hope to convince you that a more flexible licensing system that permits substantive undergraduate tracking is the key first step down a new path that will assure the best future for the profession and those it serves.

This discussion is based on 3 fundamental assumptions about the nature of the veterinary medical profession: 1) the profession deals with health and disease in vertebrates (including people); 2) it has comparative medicine as its foundation; and 3) it serves society as its principal purpose.

I cannot overstress their importance! They are simple but unchanging and powerful guides, like the North Star or the magnetic pole, that can enable our profession to navigate confidently and successfully in whatever societal environment it encounters. Even though they are simple, they are often lost sight of in the course of dealing with the minutiae of everyday professional life.

The specific signs that the profession is losing its way can be summarized as follows. The profession is disinterested in vertebrate health problems and issues associated with environmental degradation; is failing to sustain its academic and research base, and is suffering serious erosion or stagnation of its laboratory infrastructure; fails to provide graduates with sufficiently high entry level competence to practise modern herd health, public health, and ecosystem health; has very low participation rates in the clinical specialty boards and colleges; has an increasingly disproportionate share of its members occupied in small animal and equine practice (too few in other branches of the profession); continues to have a low level of participation in public health, despite lip-service to its importance; and has a

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leadership that is preoccupied with shorter term economic issues.

Background

Historical perspective

Trying to peer into the future is always difficult. One approach is to pay attention to the lessons of history, to avoid repeating past mistakes. It should be instructive to look back 100 years and see what some of the leaders of our profession were saying about the future 100 years ago. In particular, did they recognize the pending impact of motorized vehicles that was to prove so devastating to the profession? To find out, I perused 3 volumes of *The American Veterinary Review* (forerunner of the *J Am Vet Med Assoc*) for the years 1899–1901.

In 1899, a veterinarian in the western United States, having heard about the automobile but never having seen one, wrote to inquire whether or not he should dissuade his son from taking up a career in veterinary medicine if automobiles were about to supplant the horse. The editorial reply dismissed the concern and posited, "... there is no more danger of the displacement of the horse than there is of the extermination of man," and "... the horse has never been threatened with extermination in its true sphere any more than American mothers are in danger of being substituted by the incubator" (1).

Other authors at the time made similar unequivocal assertions: "... the intelligent, competent horse, in the field and on the road, in the carriage or under the saddle, in peace or war, is as highly prized today in affection or gold as the Bucephalus of Alexander the Great or the chariot horses of the Olympian Gods" (2); "... the noblest beast of creation, intimately associated with the history of all great events in the world's progress, was in no danger of suffering impairment in this enlightened age" (3); and "... we hear a good deal these days about the "passing of the horse," which is absurd ..." (4).

Nowhere in these journals did I find any recognition or acceptance of the fact that the "passing of the horse" would be a likely reality. How could the profession have been so shortsighted? By way of background, the first automobile in Canada was built in 1867, imports began in 1898, an automobile road race was held between Hamilton and Toronto in 1900, and the Ford Motor Company built its first factory in Detroit in 1903, followed by one in Windsor the following year. Manned flight occurred in 1903. I suspect the lesson to be learned is that a profession's culture can make it refractory, if not blind, to the need for change. This situation is akin to the restrictive mindset associated with scientific and cultural paradigms (5).

Another event at the turn of the century that caught my attention was the decision, taken in 1900, to close the Harvard veterinary school, the stated reason being inadequate funding (6). Even if funding was not the whole story (7), it is apparent that veterinary medicine, as it was perceived at the time, did not warrant priority in some leading universities or philanthropies. In fact, it transpires that over 20 American and 2 Canadian schools were closed during the 20th century. The lesson here is that in order to thrive and be supported, a profession must be seen to provide valuable service to society.

Contemporary perspective

The need for significant change in veterinary medicine to meet society's present and future needs is certainly not a new concern. Twelve years ago, the Pew study did a commendable job of describing much of what needed to be changed and why (8). Unfortunately, the study has had little impact, likely because it was largely a creation of the educational establishment. Because our professional associations and licensing authorities ultimately control the nature of the veterinary profession, it was they who needed to buy into a study to decide "future directions for veterinary medicine." Clearly, this has not happened.

More recently, the KPMG study in the USA (9) and the "Opportunity for Renewal" conducted by the Canadian Veterinary Medical Association (10) have looked at needed change for the future. The KPMG study was sponsored by both professional bodies (American Veterinary Medical Association (AVMA), American Animal Hospital Association) and the academic establishment (Association of American Veterinary Medical Colleges). While these studies may set out some serious problems, they are focused largely on present economic and lifestyle issues of veterinarians.

The KPMG study did not look at the potential market for veterinarians who could be educated in new programs to meet changing and new societal needs. This is a serious limitation, particularly if the tacit assumption is that veterinarians will continue to be educated and licensed as they have been in the past.

Pursuant to the KPMG study, the AVMA has established the National Commission on Veterinary Economic Issues with the mission "to improve the economic base of the veterinary profession, ensuring delivery of veterinary care and service needs to society." To my mind, this seems backwards. Good service leads to good incomes, not vice versa. Despite this perhaps overly semantic reservation, it is gratifying to see that the profession is trying to grapple with its future.

The issue of competence

The principal determinant of the future role of the profession is its competence in both range (scope) and depth. Societal forces external to the veterinary profession are driving the need for greater competency in traditional veterinary fields, and exerting pressure for new competencies to meet new situations. Coupled with these forces are impediments within the profession that make it difficult, if not next to impossible, to respond effectively.

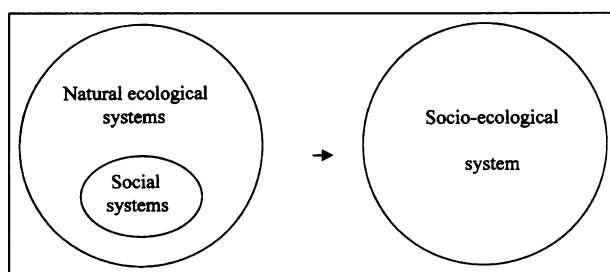


Figure 1. Historically social systems have had a limited impact on the natural ecological systems of the globe. Now these social systems are so pervasive that the globe has become essentially a socioecological system in which the health of all life is at risk.

External driving forces

Continued rapid and unrelenting growth in knowledge and technology

Growth in knowledge and technology drives the need for enhanced competence to develop or maintain marketable skills. Professions must adapt by some combination of revising undergraduate curricula, creating new undergraduate programs, mandating postgraduate experience, and encouraging or requiring formal postgraduate specialization. Otherwise, new educational programs and professions will emerge in areas they neglect.

Environmental degradation and the importance of ecosystem health

Arguably, the biggest problems facing society in the future are environmental, arising from the global fusion of social and natural systems, a way of looking at globalization (Figure 1). Human social systems have become so pervasive and so tightly connected and damaging to the natural, or ecological, systems that society can no longer act without much greater regard for nature. This globalization brings with it ever higher economic, biological, and health-related stakes. More and more of society's eggs are in one basket. There is little tolerance for incompetence.

It has become essential for us to try to understand our world as a complex socioecological ecosystem and to take the necessary steps to manage human activities in ways that promote the health of the entire planet. Simply stated, managing for animal and human health must be embedded in the wider management of ecosystem health.

It is logical to see the evolution of the application of health principles from individuals, to populations of a single species, to multiple populations, namely, ecosystems. The new field of ecosystem health (including conservation biology) is the avenue by which veterinary medicine can make important, if not unique, contributions, by drawing on its expertise in comparative medicine (11) and, more particularly, in toxicology, epidemiology, wildlife diseases, and pathology (12). Ecosystem health represents both a tremendous opportunity and an ethical obligation.

That the profession has not shown more leadership or taken a more serious interest in environmental issues is extremely disappointing. If we truly believe that veterinary medicine concerns health and disease in

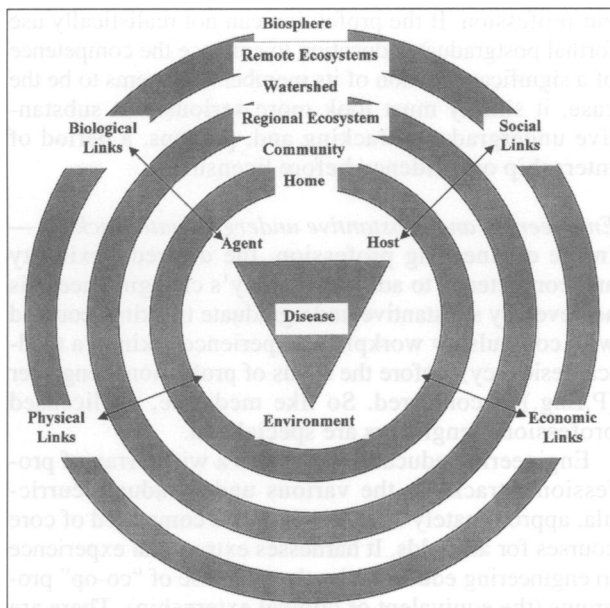


Figure 2. This diagram illustrates how an ecosystem approach can be used to investigate disease where part of the process involves assessing the biological, physical, social and economic links between the case in point within the nested ecosystem in which it occurs. Figure 2 is reprinted here with the permission of Cadernos de Saude Publica (13).

vertebrates, how can the profession largely ignore the loss of biodiversity that has been likened to an “extinction event”? To continue to ignore this issue bears comparison with our professional forefathers ignoring changes in society 100 years ago and makes a mockery of our pledge to “protect animal health and relieve animal suffering.”

We must recognize that much of the profession’s future will be determined by its response to the threats to vertebrate health associated with environmental degradation and globalization. Present curricula do not equip veterinary graduates to contribute to ecosystem health without taking considerable postgraduate training. Since this is one of the principal fields through which veterinary medicine can contribute to society in the next century, the undergraduate educational process needs to be sufficiently flexible to adapt to this reality.

Veterinary medicine must be able to move beyond its traditional focus on the interaction of host, agent, and environment, and begin to understand how this interaction plays out in the ecosystem in which it is embedded (Figure 2) (13). This is no easy task, and it will require the full time commitment of academics and, eventually, professionals who specialize in helping in the management of ecosystem health.

The continuing importance of research

Research and academic pursuits provide the knowledge, technology, and wisdom that underpin our society and its hopes for the future. In Canada, less than 1% of national funds allocated for biomedical and health research support research in veterinary institutions, despite their potential strength in comparative medicine. Dame Bridgit Ogilvie, retired director of the Wellcome Trust, recently expressed serious concern about the

weakness of veterinary research in the United Kingdom (14), so Canada is not alone in having this problem.

Most Canadian veterinary institutions involved in research have suffered attrition over the past decade. In addition, the down-sizing or flat-lining of Canada’s diagnostic laboratory and regulatory infrastructure has eroded the profession’s clinical research capacity at a time when globalization brings increased threat from disease (bovine spongiform encephalopathy, O157 *Escherichia coli*). Sadly, this situation is compounded by the fact that few veterinary graduates are interested in a research career.

Because we can not have a strong profession without a strong academic base nurtured by appropriate research, the present weakness in this domain must be cause for grave concern.

Increasing sophistication of clientele

The veterinarian’s clientele is increasingly more sophisticated, whether it is a livestock owner who manages a million dollars or more in assets, a pet owner who cruises the Web for veterinary information, or a government employee looking for expert advice. All have expectations for increased competence.

Impediments to change and competence within the profession

Some of the impediments to change within the profession that must be overcome are briefly described below.

A malfunctional culture

Until the present, our veterinary culture, by and large, has been modeled essentially on human medicine, which is defined by its concern for just one species whose value is considered priceless. To most of the public and the profession, a veterinarian is conceived as a person who is a physician to domestic animals. Notwithstanding that some physicians deal with public health, the model, at best, is imperfect for small animal and equine practice, and largely unsuitable for other veterinary fields. It makes the profession blind to new and better ways of serving society’s interests. When our profession emulates the culture of the medical profession, it is not surprising that it is gravitating to being one that is largely concerned with pets and horses, the species that come closest to humans in term of nonmonetary value.

Until now, both human medicine and veterinary medicine have used the same kind of educational system to educate their professionals; specialized competence is acquired largely through formal postgraduate specialty training programs. The economics of human medicine permits seemingly unlimited postgraduate specialization (and continuing evolution of new health professions). Significantly, the situation is vastly different in veterinary medicine.

Specialization in the human medical profession — All physicians are now required to specialize after graduation, either in a medical discipline or in family practice (about 50% in each). Medicine has abandoned internships and requires 2 years of residency training to qualify for licensure, and there is talk of making it 3 years.

There are now about 70 medical specialties or subspecialties in Canada that require anywhere from 2 to 7 years of postgraduate training. There are about 8000 funded residency positions in the Canadian health care system for the 1600 MDs who graduate annually, and this can be expected to rise by at least 20% in the near future. This lavish funding from the public purse is enabled by the fact that human life is treated as priceless. Albeit it is very expensive, the continued growth of specialties and subspecialties in human medicine provides the flexibility that is necessary to adapt to growth in knowledge and technology.

Also, the economics of human health has allowed the inception and development of a variety of new health fields, spawned by advances in knowledge and technology, by demands from the public, and, presumably, by the relative disinterest of physicians. For example, in Alberta, there are about 35 professions devoted to human health.

Given the problems that beset our health care system, one can postulate that the present system of educating and licensing physicians also may be ill-suited for society in the longer run. In any event, present problems in the human health care system should reinforce our skepticism of its utility for veterinary medicine, and increase our determination to seek a better model for our profession to develop or emulate.

Specialization in the veterinary medical profession — In spite of the desirability of increased professional competence, relatively few Canadian veterinarians have become “board certified” as specialists in a discipline or a species practice; moreover, the Canadian veterinary profession has not been able to mount an effective system of its own, as is the case in Australia and the United Kingdom (where two-tiered systems make specialization a reasonable goal for practitioners, as well as academics). We rely on the American Board or College system. This mechanism has operated since 1949 and has accommodated classical medical disciplines, but only recently species specialization. Less than 4% of the profession in Canada is qualified in a specialty, in comparison with about 8% in the United States, and does not participate effectively in many of the American Boards and Colleges. This, at best, is a rather dismal record and illustrates why the existing human medical culture is no longer adequate for veterinary medicine. The record even in the United States is wanting.

Student debt

Student debt and the modest earning power of many practising veterinarians are particularly serious problems in veterinary medicine when postgraduate study is the principal means to achieve the level of competence that is competitive or desirable in many fields.

A licensing system that constrains substantive undergraduate tracking

The fact that all veterinary students must pass a standard licensing examination severely constrains the flexibility of the educational establishment to develop new areas of competence that respond to societal needs and perpetuates the human medical model and culture within

our profession. If the profession can not realistically use formal postgraduate education to enhance the competence of a significant portion of its members, as seems to be the case, it simply must look more seriously at substantive undergraduate tracking and, perhaps, a period of internship or residency before licensure.

Engineering and substantive undergraduate tracking — In the engineering profession, the desired flexibility and competence to adapt to society’s changing needs is achieved by substantive undergraduate tracking, coupled with compulsory workplace experience (akin to a medical residency), before the status of professional engineer (P.Eng.) is conferred. So like medicine, all licensed professional engineers are specialized.

Engineering education provides a wide array of professional tracks in the various undergraduate curricula, approximately 25% of which are comprised of core courses for all fields. It harnesses extramural experience to engineering education by the wide use of “co-op” programs (the equivalent of clinical externship). There are about 30 accredited branches or tracks in engineering (15). Not all are provided at any one university (at the University of Alberta there are 9 different programs available for 3000 undergraduate students, and 600 graduate students). Presently, about 40 engineering faculties and over 180 accredited programs exist in Canada.

In engineering, a new graduate must procure 2 to 4 years of mandatory experience in the field before qualifying for licensure as a professional engineer. This apprenticeship requires 1) mentoring by a professional engineer 2) gaining experience relevant to the field, and 3) demonstrating the ability to accept increasing responsibility during the apprenticeship period.

New programs in engineering are considered for accreditation only after a particular faculty has developed a new program in keeping with criteria established by Canadian Engineering Accreditation Board. Effectively, the initiative for evolution of the profession is in the hands of the educators, approval in the hands of the profession. This system facilitates the emergence of new specialties as needed by society. Formal engineering education has an early evolutionary history, not all that different from that of veterinary medicine. Its roots go back to the 18th and 19th centuries. It began as a military necessity but was nourished by the growth of science and other societal needs. The first degree program in Canada, civil engineering, was established in 1854 at King’s College, New Brunswick. Comparable veterinary programs began about 10 years later in Toronto and Montreal. The first society of civil engineers was formed in 1887. The Ontario Veterinary Association was formed in 1874.

In engineering, specialization appears to be a seamless progression involving undergraduate education, apprenticeship, and employment. By all appearances, it is sufficiently flexible to allow the profession to adapt very effectively to society’s changing needs. The flexibility of engineering education appears to have discouraged the emergence of competing professions.

By any measure, engineering must be viewed as extraordinarily successful in serving society. At the

same time, engineers appear to be as united and committed to their profession as are veterinarians and physicians to veterinary medicine or medicine.

It is fair to conclude that the engineering model has features that have great promise for providing the flexibility necessary for the veterinary profession to thrive and flourish in the future, if it chooses to adopt them.

Mismatch between the interests of new graduates and the needs of society

The diminishing numbers of students with an interest in food animal practice has emerged as a critical problem. One can also point to the new graduate's relative disinterest in public health, ecosystem health, laboratory investigation, and research. All these areas are vital to our society. We neglect them at our peril. And look at the paucity of veterinarians who have made a career in toxicology, despite its increasing importance. During the last half of the last century, toxicants have emerged to challenge microbes as the major cause of disease, especially in wildlife. Veterinarians have made relatively few contributions to this field in relation to their potential. In comparison with the pivotal role that veterinary medicine played in the evolution of microbiology and immunology, it's a pity that the profession's role in toxicology has not been similarly effective.

Veterinary teaching hospitals provide limited clinical exposure

Veterinary teaching hospitals (VTHs) do not provide the full spectrum of clinical material required for undergraduate education and for motivating students in all branches of veterinary medicine. Historically, this has been most notable in public health and ecosystem health, but, more recently, it applies to food animals as well. Another weakness of some VTHs is that they do not attract "garden variety" cases in small animal and equine practice.

Discussion

Who defines veterinary medicine?

If the fundamental problem facing the veterinary profession (16,17) is its failure to adapt veterinary medicine in ways that enhance the profession's ability to address societal needs, it begs the question, Who really defines what veterinary medicine is all about and sets its standards of competence? Ultimate responsibility is vested in the veterinary professional bodies that 1) accredit colleges, 2) set the standard examination for all new graduates, 3) issue licenses, 4) approve specialty boards and colleges, and 5) set practice standards. Educational institutions have an important influence in these matters, but, in the end, they dance to the tune called by the profession. Strangely, our profession behaves largely as if the colleges call the tune, and that does not square with reality. The failure of the Pew study (8) to have any significant impact can be attributed in some measure to licensing bodies, which were challenged to "be open to changes representing progress in education," but which have not responded. To be fair, the Pew study took the position that curricular change must precede change in licensing. This position may still be dominant among

leaders of the profession, but, in practical terms, it has effectively squelched any substantial change in veterinary college curricula, because no commitment to more flexible licensing has been forthcoming.

I have been amazed that many veterinarians believe the educational establishment should bear the brunt of concern about the ills of veterinary medicine. While many curricula have been improved, the changes, at best, can be only tactical because of the constraint of the licensing system whose control lies outside their reach.

As the Pew study illustrated, the academic community has recognized that the profession has serious problems. Unfortunately, it has been reduced to wringing its hands and revising the curriculum, yet again, as it strives to deal with change. The need for initiative lies elsewhere.

Competition and emergence of new disciplines

If a profession does not provide the services that might reasonably be expected of it by society, it is certain that new or existing professions or disciplines will fill the void. Much of veterinary medicine concerns health management. Because many animal health related sciences are not tightly protected by medical practice acts, competition is, or will be, a major factor in herd (population) health. In the fields of public health and ecosystem health, competition is an even bigger factor. Veterinarians will simply not be able to compete effectively in the health fields in the future, unless they are better educated for this domain. The lesson from human medicine is clear, other disciplines will serve fields that are neglected by veterinary medicine.

Notwithstanding the need for higher levels of competence, some veterinary leaders believe it might be desirable to develop a new "baccalaureate level" program in animal health and to enact practice legislation that would allow this new class of paraprofessional to undertake more of the duties that are restricted to veterinarians at present. Such graduates could then acquire a DVM degree with a further 2 years of appropriate education. This is seen as a potential means of dealing with the issue of the shortage of veterinarians with an interest in food animals.

Possible courses of action

Adopt a more biological culture

It can be argued that the biggest impediment to change for the veterinary profession is the profession's uncritical, if not blind, emulation of the medical profession. A hard look at the evidence indicates its culture and practices do not provide the flexibility to sustain the competence needed to serve society.

The veterinary profession needs to take the broader view that veterinarians are biologists who are expert in comparative medicine and its wider application to promoting health of vertebrates, including people. A culture based on this premise would encompass the best of the narrower "physician to animals" view and provide the freedom to make the desirable changes to the profession driven by circumstances in the external world.

Adopt substantive undergraduate tracking and designated licensure

It would be a simple matter for licensing agencies to immediately introduce more flexibility into the licensing process by offering separate examinations tailored to a major field of veterinary medicine. The existing general licence could remain an option and university curricula could be adapted as faculties see fit.

Just as in engineering, colleges can be relied on to do a superb job of developing appropriate programs to respond to the priorities of society. Also, such a process opens up the possibility of introducing quotas for various tracks to more easily respond to issues like the shortage of veterinarians with a primary interest in food animal practice. It is safe to predict that resources will flow to faculties seen to be serving those societal needs that have high priority.

As in engineering education, designated licensing would encourage more rationalization among the faculties, allowing them to enhance their particular areas of expertise, a development that could be coordinated nationally. The creativity of the academic establishment would be unleashed.

It is gratifying to see the concept of designated licensure supported in a lucid, recently published commentary article (18). It is even more encouraging to learn that the University of Utrecht and the Netherlands are adopting a system of substantive undergraduate tracking and designated licensing (Otto Radostits, personal communication), such as I am advocating here today.

Expand undergraduate enrolments

With the advent of designated licensure, it would be logical to encourage universities with an interest and the resources to expand undergraduate enrolments by admitting students into food animal, public health, ecosystem health, and laboratory investigation tracks, as soon as possible. If the case can be made that small animal and equine fields are also needful of more graduates, enlarged enrolments in these tracks should also be considered.

Expand nonuniversity opportunities for externship, internship, and residency

In present circumstances, it seems that college VTHs can hope to provide substantive clinical experience to undergraduates only in small animal and equine practice, and limited experience in food animal practice. Therefore, the colleges need to reach out and involve selected private practices and other agencies to a much greater extent in the educational process in those fields in which they lack clinical material. A model for doing this in the government and corporate sector that has been developed by the Virginia-Maryland Regional College of Veterinary Medicine in its establishment in 1989 of the Center for Government and Corporate Veterinary Medicine (19).

The nonuniversity sector also has the potential to become more involved in providing supervised clinical training for new graduates, for those switching careers, and for those coming from abroad. To my knowledge, no veterinary licensing body in Canada or the United States requires mandatory postgraduate experience before granting a license, in sharp contrast to the requirement

in medicine and engineering. Perhaps they should. It is not difficult to envisage how a mandatory, paid internship, served in an approved "teaching practice," could emerge as a reasonable means of enhancing the competence of all graduates and fitting them for licensure, or serving as a bridge mechanism for a major career change.

Universities could appoint adjunct faculty in these teaching practices and agencies, and couple this with a comprehensive continuing education (CE) program that would assure that such adjunct faculty would have the skills and knowledge required to be effective mentors. Such a program would enhance the competence of the practitioners, as well as provide essential educational opportunities to students. Adjunct faculty would have to receive remuneration and the expense of the CE programs would likely have to be borne by the university or a grant of some sort.

Enhance comparative medicine in the curricula

If a more flexible system of designated licensure and substantive undergraduate tracking were adopted, it would bring into sharp focus the importance of the core curriculum in comparative medicine, because it is the universal element in the education of all veterinarians. One could venture that this will lead to the realization of the kind of attractive curricular development that was proposed by Calvin Schwabe in 1977 (7). The desirability of putting more emphasis on comparative medicine in veterinary curricula has been recognized and attempted by various educational institutions for over 100 years, but with modest success, at best. Designated licensure will allow an academic environment in which comparative medicine can achieve its promise.

Promote specialization

A system of designated licensure can be expected to launch more graduates on a track leading to certification in a specialty. In addition, CE programs that can assist a higher proportion of the profession to become board certified should be developed by the universities and perhaps others. This is especially desirable for species specialties. The American Board of Veterinary Practitioners now provides the best way of doing this, in the absence of a "Made in Canada" process.

Enhance veterinary research

Some means needs to be found to motivate and enable more veterinary students to opt for careers in research and to enable veterinary faculties to be more competitive and responsive to societal needs. Paying more attention to comparative medicine would perhaps motivate students to undertake a career in biomedical or health research. It might also serve to make faculty more focused on biological phenomena that have broad significance in medicine or health management and hence direct their efforts into research that is more likely to attract funds and approbation from agencies that support more basic research.

The introduction of a substantive undergraduate track in laboratory investigation might attract students directly into a research career and thereby help to reduce the time it takes to train a veterinarian to become an independent

investigator. This would be more in line with other biological sciences. Again, student debt is a related factor.

Conclusion

At present, the future of our profession is severely constrained by its lack of flexibility to adapt to changes in society. The only logical path available for the profession to follow in order to cope is to increase its range and depth of competence. In particular, it must prepare itself to play a much stronger role in herd health, public health, and ecosystem health. The only viable means of doing this for the longer term is by adopting an educational system that combines substantive undergraduate tracking, compulsory internship, and designated licensure.

The profession must accept that the present culture of the profession, modeled solely on the human medical profession, is no longer functional. We can retain the best of the human medical model in our profession, but we must set it in a independent culture that can embrace all vertebrates in an economic and ethical context that is realistic.

The engineering profession has evolved a superbly flexible, efficient, and effective system for adapting a profession to change. It has adopted substantive undergraduate tracking rather than postgraduate studies to give it flexibility. It relies on educational institutions to create new undergraduate programs that incorporate new technology and knowledge to meet changing societal needs. It is unrestrained by a professional licensing process that requires all its practitioners to pass a single standard examination. It has been an extraordinarily successful strategy that veterinary medicine could adopt forthwith. Only our culture stands in the way.

The introduction of designated licensure will set in motion a cascade of developments in veterinary education that will lead to a renaissance in which the profession will achieve its full potential to serve society. This is the path that leads to a professional landscape full of new opportunities for service to society and for personal reward. It will allow us to address our responsibilities to all vertebrates.

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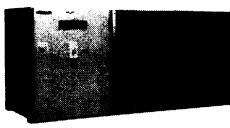
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