

Emergence of Epizootics

IN THE VETERINARY DOMAIN, the eighteenth century in America differed but little from that which preceded it. Both Europe and America were in a political and military ferment during much of the century, and great changes had been wrought in economic life by the century's end. The more or less communal life of the colonial town slowly gave way to an expanding rural economy, but except for a broadening of the agricultural horizon, few large scale changes in the fundamental philosophy of the farmer occurred. The cultivation of grasses as a hay crop beginning about 1765 had a greater potential insofar as the welfare of animals was concerned than was realized for some time. Except for the Pennsylvania Germans, little thought as yet was given to providing housing or the other amenities of good management of animals.

ANIMAL HUSBANDRY AND ANIMAL DISEASE

In the older settlements continual cropping of the land, especially by such demanding crops as tobacco, led to progressive diminution of yields with the result that forage and feed for animals became more scarce. Animal starvation continued to exact a heavy toll, undoubtedly accentuated by the complications of nutritional deficiencies resulting from soil depletion even when feed was adequate. Old pas-

tures and barnyards (more often yards without barns) became reservoirs of infection: the sanitation of a generation or so previous, or lack thereof, was considered adequate—and why not?—it sufficed for grandfather. If a crude stable had been erected, disposal of manure was only an occasional problem—on those occasions when the barn had to be moved off the accumulation of several seasons to prevent the horns of the cattle from further damaging the already leaky roof. Obviously, those doors which were still on hinges opened outward. While some of the apparent increase in outbreaks of animal disease may be attributed to better reporting, that an actual increase did occur can hardly be doubted. In the newer settlements, and especially upon the pioneer fringe, the events of the previous century were repeated.

In Europe the ravages of rinderpest and other cattle plagues became so violent that drastic action was called for. In the half century beginning with 1711, some 200,000,000 cattle died in Europe. Intelligent attacks upon the problem had been made by medical men at the behest of their governments, but little progress of a continuing nature occurred until the establishment of the veterinary schools of France in the 1760's. The success of these schools, and the organization of a veterinary profession that logically followed, led to the establishment of twenty schools in a dozen

countries before the end of the century. Not all of these immediately fulfilled their avowed purpose, but the concept of a veterinary service had come into being. The London school in particular, for a half century after its establishment in 1791, failed to deliver the bright promise it might have had, and the impotence of the British veterinary profession had repercussions in America.

With a predominantly British heritage, it is not surprising, therefore, that little or no overt thought was given to the need for a veterinary profession in America before the end of the eighteenth century. Not even George Washington, who, as one of the most advanced agriculturalists in colonial America, was in touch with foreign developments, left any indication that he had considered the need for professional veterinarians. This, in spite of a never-ending concern for the welfare of his animals which — he leaves no doubt — were often in need of better care than they received. The story of animal diseases as they affected his Mt. Vernon stock is the most substantial record given us by any individual during the eighteenth century. Yet these observations were merely incidental to the everyday interests of Washington, and a major gap exists for the war years when more pressing matters engaged his attention.

Problems in Pennsylvania

Pioneer life in Pennsylvania was beset with the same problems that faced settlers in the other colonies. Heavily wooded, few rural areas were without oppressive swarms of flies, mosquitoes, gnats, and punkies which attacked cattle and horses even more than they did man. A contemporary report states:

The chief plague to horses and cattle was the large horse fly which drove them in from the woods every clear day about eight or nine o'clock. Exposed horses died under the infliction by pain and loss of blood. We made fires of rotten wood and chips and the cattle would run in as the morning advanced and hold their heads and necks in the smoke.

These "gnat fires" were not only necessary, but aided in clearing the forests; as land was cleared the problem lessened as it had in Florida a century earlier.

The woods also harbored many predators; wolves were a major deterrent to sheep raising; bears killed swine; foxes and wildcats claimed poultry. In the mountainous areas rattlesnakes endangered man and beast alike, except perhaps for hogs — at least it was reported "hogs are immune to their poison." The hogs themselves killed many; others were killed by dogs. As late as 1792 one farmer in Pennsylvania reported killing a thousand rattlers in two days. The bounty system claimed many wolves, and these predators were driven westward with the expansion of agricultural land, but their legacy was inherited by packs of feral dogs which, in eastern Pennsylvania at least, probably destroyed more sheep than the wolves ever had.

With the woods serving as both pasture and shelter, and doing neither well in the harsh winters, cattle in droves died of starvation, or by poisoning from laurel, wild cherry, or hemlock which they had eaten in desperation. Already poor as milk producers, cows lost in the woods for a few days would dry up quickly from not being relieved of what little milk they had to offer — and the loss of this little was hardship enough even if the animal itself was not lost to wolves or Indians.

Where sheep could be protected from predators, they were reported early in the century:

in considerable numbers, which are generally free from the infectious diseases which are incidental to these creatures in England, as the rot, scab or maggots. They commonly bring forth two lambs at once, some twice in one year, and the wool is very fine and thick.

But by the end of the century, the situation, perhaps attributable to inbreeding, was such that:

A continued diminution of size takes place; perhaps, however, the greatest defect is want of increase, arising both from the barrenness of the ewes and the lambs being so weak and sickly as to die in great numbers.

In the first communication of the Massachusetts Society for Promoting Agriculture founded in Boston in 1796 by a group of public-spirited citizens, we find a growing dissatisfaction with the state of affairs. Concerning sheep husbandry in the region, it is stated:

The management of sheep is said to be a science in England: It is certainly not one here in America; and the inference is that our sheep well deserve the attention of spirited improvements, since they are so profitable.

The Lincolnshire rams recently imported by a few who apparently had given some thought to the matter, however, were "ill flavoured, not very healthy, and ill adapted to the short sweet food of our hills." On cattle, the publication goes on to charge:

It is very careless and stupid to go on rearing the calves from poor cows . . . their good or bad qualities are doubtless hereditary . . . the bull is to be chosen with no less care than the cow.

Nor were all the Pennsylvania Germans of the eighteenth century the paragons of perfection in farming that legend has made them out — at least those "economical Germans" observed by one traveller in eastern Pennsylvania in 1794. This Englishman, Davy by name, notes that no bedding was used for horses: "their Stables having all boarded floors are clean and dry," but finds it:

extraordinary that amidst this System the Farmers are so inattentive to the making or saving of Manure & instead of a regular Court yard their Stables & Barns are plac'd in a Waste where the Dirt and Dung collect until the Building is almost buried. . . . Their Cattle are turned into the Woods . . . [and] are induced very regularly to return to their Homes by being fed with Salt which they are all so fond of that they may be effectually tamed with small Quantities frequently given to them and given once a week is wholesome & considered absolutely necessary to their Health.

Monster Mania

About this time there was a notable upsurge in livestock farming, possibly as a

subconscious reaction to a growing spirit of nationalism. In the 30 years following 1765, the livestock population per farm in eastern Pennsylvania had more than doubled, and there were more farms. According to Fletcher:

This is one of the most important events in the history of Pennsylvania agriculture. It is especially significant in its relation to the maintenance of soil fertility and the development of a permanent agriculture.

This renewed interest in animals, however, produced some less than logical overtones. In particular, there was ushered in an era when it became more fashionable to vie with one's neighbors to produce the biggest rather than merely the best. An advertisement in 1791 may be considered the herald of this monster mania:

To the Curious: To be seen at Jeremiah Bullfinch's, near the Mill-Bridge, a live HOG, That is thought to be the biggest ever raised in this Country, weighing upwards of 1000 weight. The price for viewing of said quadruped is 4 pence.

This craze was not confined to one place or time; it raged throughout much of the nineteenth century, and indeed is not completely a dead issue today.

Horses were not shod until after 1750, even for heavy hauling. Despite a generally stony soil, Penn himself states that an unshod horse would go 50 miles a day without damage to his feet. But for various reasons — flies, cost of transport, and greater cost of keeping, plus the fact that they were less useful than oxen in breaking new ground — few horses were kept during the early days. Ear-cropping or branding on the settlement, or summary justice by hanging in frontier areas was the fate of the horse thief. To improve the breed, Penn had directed in 1682 that no person shall "suffer any Stone horse [ungelded] to run at large after two years old, under thirteen and one half hands high." Later the proclivities of some of the inferior "stone horses" caused the age for gelding to be reduced to 18 months.



Shoeing of horses did not become common until after about 1750, due in part to the cost of imported iron. Although at first blacksmiths did little in the way of farriery, their increasing business in shoeing may have accounted for many paying increasing attention to the ailments of horses. Mayhew: *Illustrated Horse Doctor*

The Village Blacksmith

The blacksmith had always stood at the head of the tradesmen in the colonies, and after 1750 shoeing of both horses and oxen is frequently mentioned as a common activity of the smith. Little is said of the practice of farriery by blacksmiths, and during the Revolutionary war the practice of these two groups is clearly demarcated. Probably the primary reason for horses not being shod during the early colonial period was the scarcity and cost of iron.

Farriers apparently did shoe horses, however, for in 1779 — price ceilings being imposed during the Revolution — there was decreed a maximum price allowable: "Farriers for Shoeing a Horse all round £6 and for shifting a set of Shoes 48 shillings." At this time the cost of an ordinary felt hat was four pounds, and of the best beaver

hat 35 pounds. Refined iron was set at £37 per hundredweight. Dependence upon imported artisans and materials, of course, has always resulted in high prices. In 1842, it was stated:

The price of shoeing a horse in Iowa is \$5, and it takes a load of corn to pay for it . . . a man who knows how to hammer iron, can make more money than a member of Congress.

And a note in a newspaper in 1958 stated that hayrides were becoming a thing of the past because, among other reasons, the price of shoeing horses had risen to \$25.

In the breaking of new ground, oxen were preferred to horses because of their slow steady gait, and when worn out — or in times of extreme adversity — they could be eaten; horsemeat, and still less customary items of food, however, more than

once graced the pioneer table. The shoeing of oxen, at least the heavier ones, required a frame with a wide belly band to support the animal, for many were unable to stand on three feet. Ox pulling contests were popular events at fairs. There was never enough animal power to supply the demand, however, and those who may have been critical of the red man for having his women do all the agricultural work perhaps little realized that the average farmwife daily did more than a dozen squaws — and raised a large family in her spare time. Small wonder, then, that many farmers buried three or four wives! Dogs, too, did their duty; in taverns they were used to turn the spits by putting them on a treadmill with a live coal so placed as to discourage them from stopping. Frequently it required several hours to roast a large chunk of beef.

Medical Capital of America

Philadelphia early became the medical capital of the colonies, the first medical school in America being founded there in 1765, but elsewhere physicians frequently were held in low repute. It was generally safer to let nature take its course; if the “leech,” as the doctor was known in rural areas, was in doubt he drew a pint of blood — if he was sure of his diagnosis, he drew a pint of blood. While good medical training was available to those who could afford to go to England, the compensation for medical services was so low, except for “fashionable physicians” in the cities, that foreign study was out of the question. Despite this, there were some 3500 medical men in the colonies at the outbreak of the Revolution, of which about 400 were graduates of foreign universities, the majority being trained locally via the apprentice route or not trained at all. The establishment of medical schools in the late eighteenth century was a prime factor in elevating the practice of medicine in post-Revolutionary America. Unfortunately, the new country was to wait another century for its first veterinary schools to exer-

cise a similar salutary influence upon animal medicine.

Considering the times, an impressive number of books was published in colonial America. Few of these, however, were for farmers; probably few farmers read much, either for lack of time or inclination for books. Books were expensive, and farmers came to consider them as unnecessary luxuries. When Benjamin Franklin, impatient with the conservatism of his farmer friends, purchased 50 copies of Jared Eliot’s *Essays on Field Husbandry* to distribute among them, many declined his gift, saying in effect: “We want no information on husbandry; we know all about it. Give us labor.” And when agricultural societies were formed, somewhat belatedly in the late eighteenth century, some doubting members still insisted that the best way to improve agriculture was to “lay your hands on the plough-handles and urge on your horses.” Those farmers who did want books had to turn to England; of 71 titles added to the library of the Philadelphia Society for Promoting Agriculture in 1811–1814, only seven were native works.

EARLY VETERINARY LITERATURE

Books dealing with animal disease were even more scarce in colonial America than those on agricultural matters. By 1710, when the first American work touching upon animal diseases was printed, farming, of course, had been a fact for two centuries in the colonies. While some books on farriery undoubtedly had been brought from England, it is painfully evident that those who had animals, or professed to treat their ailments, were even less anxious for book learning than were dirt farmers. For the sake of animals, however, this may have been just as well, for few of the books published in England prior to 1750 could have done much but heap more misery upon an already miserable brute creation. And by the time veterinary works did become available, public taste in these matters had become so degraded that despite the fact that there were a few good works that might

have been lifted from the British, those of the stripe of Markham held the most appeal.

First in the Field

The first work published in the colonies to touch upon animal disease appears to have been an anonymous little *Husband-man's Guide* (Boston, 1710; New York, 1712). In less than 50 small pages this covered: "Directions for Husbandry. . . . Choice Physical Receipts for divers dangerous Distempers in Men, Women and Children. . . . [and] Useful Rules of Arithmetick." A dozen pages are devoted to:

The experienced Farrier, containing many excellent and profitable Receipts for the curing of Diseases in Horses, Sheep, Cows, Oxen and Hogs.

The entire work is taken from or patterned

after Markham — whose various writings encompassed all aspects of domestic life.

Two examples of typical Markhamian nastiness are found in the treatments for spavin and farcy:

For the blood Spavin: Tye up the vein, and let blood below the tying, fry Cow-dung in linseed oyl, and apply it. . . . For the Farce [sic]: Take Hogs grease & the juice of Rue, each 2 ounces, stop the quantity of a Walnut in either Ear of the horse, stop it in with Cotton, and sow up the ear for 24 hours.

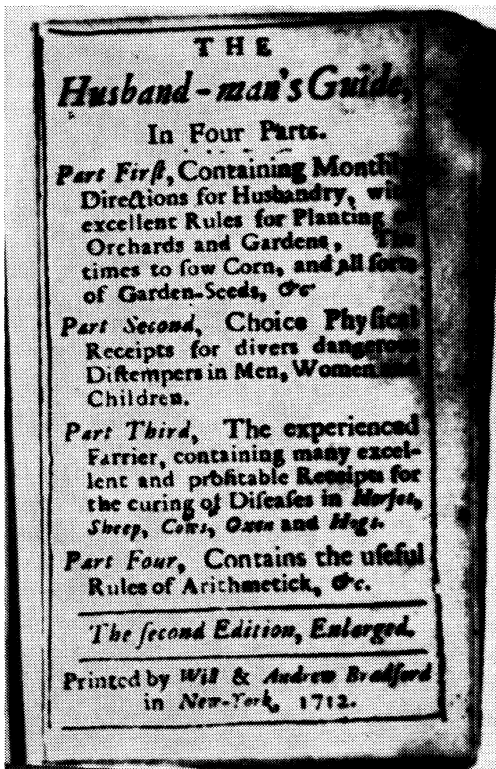
At this time, however, there were few other British works that would have been much better to copy from, and while the ancient writers on husbandry would have been good sources, these were not yet available in English translations. Although it seems difficult to reconcile writings like this "Experienced Farrier" with reason at any time, the continued popularity of various versions of Markham for another century or more is still less defensible, for by 1750 several fairly respectable veterinary works had been published in Britain.

Pater's Errors

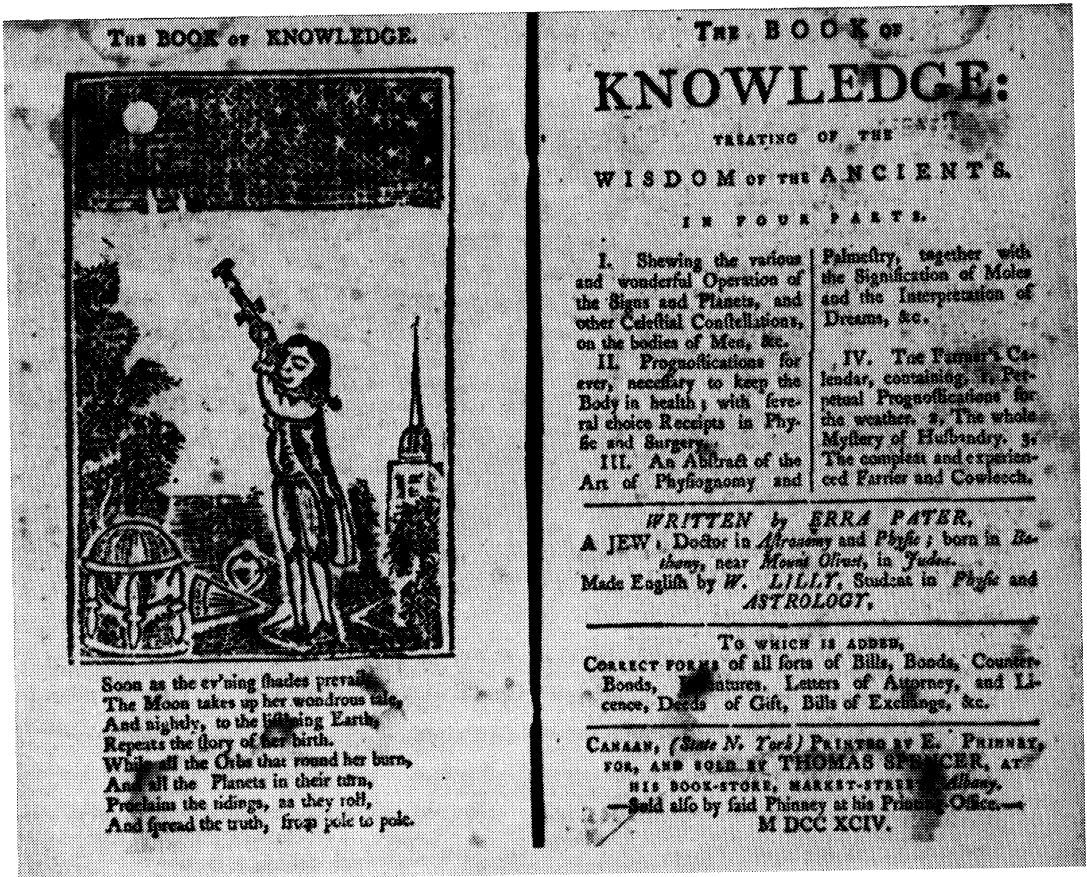
This *Husbandman's Guide*, a second edition of which apparently was required only two years after its first appearance, was the progenitor of an interminable series of such omnibus works on domestic matters. One such, *The Book of Knowledge* (Albany, 1794), by Erra Pater, and "treating of the Wisdom of the Ancients," includes such diverse subjects as astronomy, medicine, palmistry, meteorology, and "the whole Mystery of Husbandry." Thirteen pages are devoted to:

The compleat and experienced Farrier and Cowleech, containing above an hundred approved receipts and medicines, for the cure of all distempers in cattle, as horses, kine, sheep, and hogs; with directions how to find and know what their diseases and infirmities are.

While some of these "approved receipts" are taken from the ancient writers — who had their share of harsh and dirty treatments — the more rational aspects of earlier practice are overlooked.



The Husband-man's Guide, Boston, 1710, New York, 1712, was the first American work to deal with animal diseases — in a wretched Markhamian fashion. University of Michigan Library



An example of the mystic omnibus household works which enjoyed some popularity, Erra Pater's *Book of Knowledge*, including "The compleat and experienced Farrier and Cowleech," did little to advance the veterinary art of the times. University of Michigan Library

The relative simplicity of some of these measures undoubtedly had some merit in a country where apothecary shops were not abundant and drugs were expensive when available. At the opposite extreme was Gibson's *Farrier's Dispensatory* (London, 1721, Philadelphia, 1724?), in which prescriptions calling for 20 to 30 ingredients are the rule, and those with 50 or more are not uncommon. Needless to say, one edition of Gibson's work would be sufficient to meet the demand in America (and there is some doubt as to whether this work was published here at all). Some examples of Erra Pater's rough and ready treatments include:

For a bruised back: dip a wad of hay in water, lay it on the sore, and keep on an old

saddle. . . . *For a broken wind:* take boar's dung, and powder it, and pour a good quantity of it into milk lukewarm; give the horse a quart every third day. . . . *For a festered sore:* take lime, tow, and horse-dung, temper them well together with pepper, and the white of an egg, lay it to the sore. . . . *For a fistula in the head:* take the juice of houseleek, and dip a lock of wool in it, put it in his ear, and bind it fast.

For the ringbone or spavin: burn it with an hot iron, and anoint the hair about it with neat's-foot oil. . . . *For the staggers:* take a spoonfull of *aqua vitae* [brandy] and a spoonful of salt, put it into one of his ears, and so likewise in the other ear, and bind them up. . . . *Against [urinating] blood, or bloody flux:* take a frog, and cut off his left leg, and so put him alive into the beast's mouth; have ready a handful of salt mixed with a pint of good strong ale; and soon as you can, after the frog, give the beast to drink.

Pater's surgery is equally rough and ready:

For the haw, or horn in the eye, if you cannot have a farrier to do it, take a cord with a stick, and twist his nose very hard, and hold him fast, then take the upper lid of each eye, and with needle and thread give it a stitch to the top of the horse's ear, and underneath the eye-lid you shall see a skin with a hard gristle or horn, which with a sharp penknife, you may cut out; but be careful in cutting it too much; then take a little small beer or ale, and spurt it in to wash it, and it will help him.

And superstition rears its ugly head:

To cure any swelling in the leg: Mark the ground where the said leg or foot doth stand, and with a knife or other thing dig up a turf or piece of earth just where the leg or foot did stand, hang the same on a white thorn . . . and as the turf drieth, so shall the swelling cease.

What would seem a practical suggestion — “For a sow that eateth her pigs,” is to take the poorest piglet, annoint it with the juice of stoncrop, and give it to her to eat, “She will never do the like again.”

Preventive Medicine

Of the several veterinary works published in America prior to 1800 — or indeed for some time after — the one we should like to have seen set the pattern for practitioners was James Clark's *Treatise on the Prevention of Diseases Incidental to Horses* (Philadelphia, 1791). First published in Edinburgh in 1788, this valuable little work was not fully appreciated in Britain, although it did go through four editions to 1805. One edition appears to have sufficed for America; unfortunately it was Markham whose heavy hand was felt from the grave for two centuries or more. That Clark's work made little impression upon American thought may be appreciated from the statement of Merillat and Campbell concerning failure of the Army in the 1890's to recognize the need for veterinary hygiene:

Although Clarke's “Preventive Veterinary Medicine” had been published in Philadelphia a century earlier there were none who proclaimed the advantages of preventive veterinary medicine to the army.

It is something of continuing injustice to Clark that the market value of his book is yet today substantially less than those of Markham. The later editions of Markham today command two or three times the price of Clark's 1791 work, and the 1764 Markham would buy ten copies of Clark. The reason for this is not difficult to comprehend: the few copies of Markham extant today are dog-eared and shabby from long use, while comparatively handsome copies of Clark are obtainable. Mortality in the stable obviously is greater than on the library shelf.

Clark's work, however, does deserve some consideration — if only to see “what might have been.” His motto, taken from Lucan: “to hold the golden mean, to keep the end in view, and follow Nature,” is literally the golden key to his philosophy. Clark says:

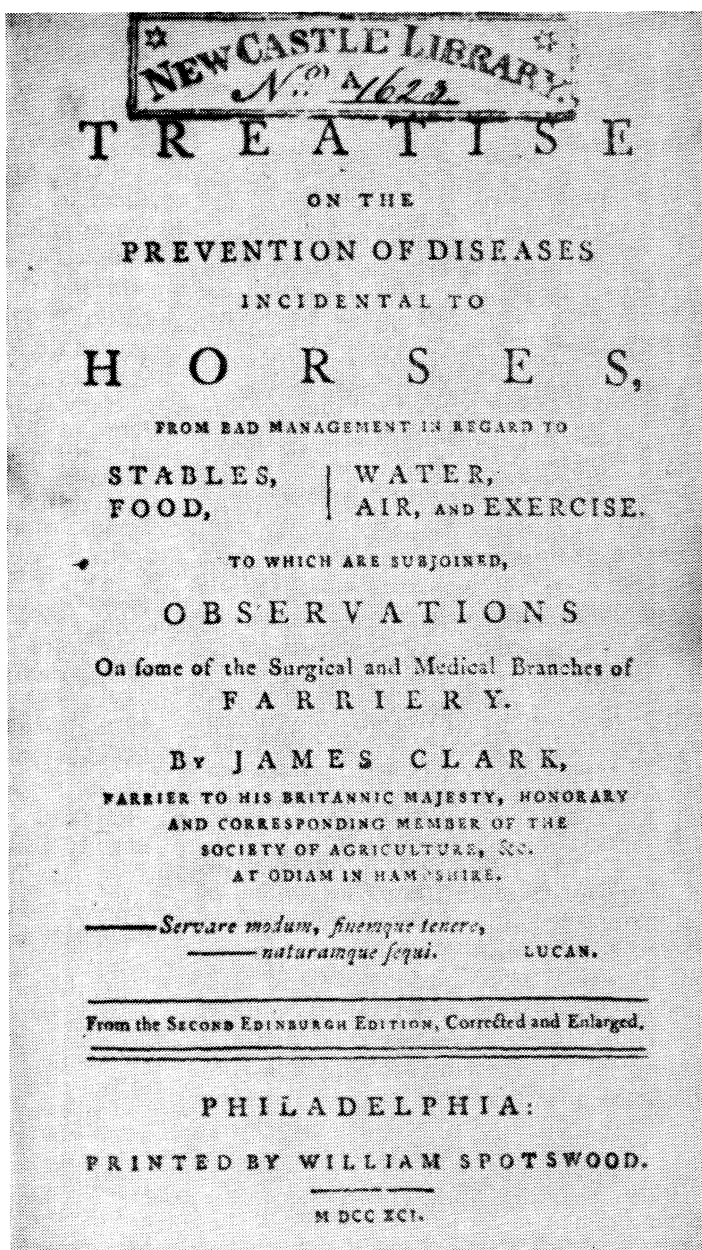
The propriety of this excellent maxim is, perhaps, in few cases more applicable than in the following subject, relating to the Management of Horses. . . . There is no subject, of equal importance, in which people are more apt to be led by prejudice in favour of certain established modes and customs. . . . The health and soundness of horses depend greatly on the manner in which they are treated; and it ought always to be observed, as a general maxim, that the nearer we approach in the management of horses, to that which is most agreeable to their nature, they will be in the greater perfection. . . . Health is the faculty of performing all the functions of animal life in the most proper and perfect manner.

Clark was a strong detractor of the common practice of regular bleeding and purging as prophylactic measures, for:

In order to preserve horses in this healthful state, it is not necessary to have recourse to medicine or bleeding, &c. &c. by way of preventing diseases, or preserving them in health.

The latter, he insists, can be accomplished by providing clean and airy stables, good feed, moderate exercise, and good grooming. He rails:

Many of the hovels at present used as stables do not even deserve the name. . . . Surely there can be nothing more hurtful than keeping a number of them [perhaps 30 or 40 horses] shut



Clark's *Treatise on the Prevention of Diseases Incidental to Horses*, Philadelphia, 1791, a reprint of the British edition of 1788, was the first truly meritorious veterinary work to be published in America. However, it did not achieve the popularity of many less deserving works.

in a close warm stable, where they must constantly breathe a hot foul-air which, at the same time, is strongly impregnated with the putrid steams of their own dung, wind, and urine.

Clark on Contagion

At a time when the nature of contagion was little understood — or generally not believed in, for the concept of spontaneous

generation of disease was still paramount in the minds of most — Clark states:

Large crowded stables contribute greatly to communicate contagious or infectious diseases. . . . Those epidemical diseases amongst horses which have appeared in Britain . . . raged with most violence in those stables where a great number of horses were confined together in one large stable, whilst its effects, in small well

aired stables, was more mild and less destructive.

On the fundamental unity of disease processes in the several species, Clark says those of the horse:

have a great analogy to those of the human body . . . if the symptoms attending any one of the diseases to which horses are liable were faithfully related to a physician, although he never saw a sick horse, yet he could from thence name the disease. . . . The cure of the diseases in horses must depend upon the same principles as those of the human body.

Clark was insistent upon good nursing care of the sick horse — a concept practically unknown in his time and he substituted simple medicines for the fantastic faragoes of the farrier: “It is amazing what different kinds of compositions are forced down horses throats on these occasions.” While it would be too much to expect that he would advocate doing away with bleeding entirely, Clark asks:

Why let blood from them on every trifling occasion, unless there may be such symptoms as may require it? . . . it impairs their constitutions, subjects them to diseases, and hastens a premature old age.

Farriers, both professional and amateur, of Clark’s time were more interested in cures than causes, and thus pharmacy was of more concern than pharmacology or physiology. Clark, who later wrote a textbook on *Veterinary Physiology and Pathology* (1806), gives a detailed and accurate account of the anatomy and physiology of the heart and the circulation. To this he adds:

some observations on the pulse of horses, a due attention to which is of the utmost consequence to practitioners in farriery, and which, in the general practice, seems either to be not understood, or not attended to, for, without a proper knowledge of the pulse, we neither can form a right judgment of diseases, in which the vascular system is affected. . . . Young practitioners ought thereto make themselves well acquainted with all the variations that take place in diseases, together with the changes that happen when deviating from the healthy state to the morbid or diseased.

For the benefit of “young practitioners” —

apparently he knew it would be folly to attempt to teach old dogs new tricks — Clark gives four pages on the pulse in health and disease.

These were the times when horses had to undergo their semiannual purges to keep them in health; so drastic were these that many animals were unfit for work for several weeks afterward. Moreover, the aloes ball was the first recourse in any form of disease. Concerning this practice, Clark says in derision:

Many people . . . whose heads are fuller of humours than their horse . . . are but too fond of giving purging medicines, and frequently prescribe them whether the case may require them or not. . . . It ought always to be remembered, that great evacuations weaken an animal body, and, if they are repeated too frequently . . . or, if they are carried to excess . . . the powers of life are quite overcome, and death follows of course. . . . Mild purges are much safer at all times, and of more benefit to the constitution.

While Clark does give specific directions for the symptomatic treatment of disease, his work was understandably the despair of the farrier who “played it by ear” in diagnosing disease. Frequently the diagnosis may have depended upon the diseases for which the farrier may have had drugs to dispense. Clark says in his introduction:

My design is not to advance or support any extravagant hypothesis respecting medical theories, or to recommend insignificant nostrums, as infallible remedies for this or that disease or lameness; but to make some general remarks and observations upon the common methods at present in use in the management of horses.

His principal philosophy is summed up in a chapter on “Observations on Giving Medicines as Preservatives or Preventatives” in which he attacks those who believe their main mission in life is to meddle with nature:

If a man or a horse is in a state of health, what more is required, or how can they be made better; health is the most proper state of an animal body, and it is not in the power of medicine either to make it better, or to preserve it in this same state.

Home-grown Herbs

The American Academy of Arts and Sciences, founded in Boston in 1780, had among its objectives: “improvements in agriculture, to promote medical discoveries, etc.” On the latter, it is noted:

Many important discoveries in pathology, as well as in the animal economy, have been in great measure useless to this part of the world, in consequence of a situation so remote from ancient seats of learning and improvement.

One means taken to correct this deficiency was the publication, in the first volume of the Academy *Memoirs* (1785), of a lengthy article on indigenous herbs of medical value, including applications to animal medicine. A few examples of the latter follow.

Roots of the yellow water flag “have been mixed with the food of swine bitten by a mad dog, and they escaped the disease, when others, bitten by the same dog, died raving mad.” Mezeron “is used with success in discussing indurated tumors. Farmers apply it to swellings in cows’ bags.” Pyrola, or falsevine:

if it be eaten in large quantities, will occasion abortion in all kinds of herbivorous animals . . . in some instances it has deprived farmers of almost all the increase of their flock in the spring.

The root of garget, or pokeweed, which later became a favorite remedy for mastitis (garget): “Farriers give a decoction to drench cattle, and apply them in the form of a poultice, for discussing tumors.” Concerning cowslips:

It has been supposed that the remarkable yellowness of butter in the spring is caused by this plant: but . . . it will occasion such inflammation, that they generally die.

The juice of ground ivy in wine “will destroy white specks upon horses eyes,” but is hurtful to horses if eaten in large quantities. The oil of origanum “is used by farriers as a caustic” (and is still used in strong liniments). Mountain cranesbill “is given to cattle when they make bloody water.”

THE RECORDING OF ANIMAL DISEASE

Records of animal disease during the eighteenth century are noticeably lacking, particularly before 1750. This may have been due in part to a still slow buildup of reservoirs of disease, but more animals, undoubtedly, died of disease than are on record. Although animals continued to be concentrated around the larger settlements — many still on the town commons — increasing numbers became scattered on farms at or beyond the fringe of town. Physical separation, together with poor transportation, provided a sort of insular segregation of individual groups of animals; thus while individual flocks or herds may have been decimated from time to time, epizootic disease had not yet become a problem.

Another factor, however, may have operated to conceal to some extent the proportions of the disease problem that must have existed. Relatively fewer outbreaks of disease appear to have been reported during the first half of the eighteenth century than in the century preceding when the animal population was much less. The higher concentration of animals — frequently within the confines of the town — would have predisposed to disease at this earlier time: Moreover, the incidence of disease under these conditions would have been more apparent as well as more real, and thus more likely to be a matter of record. As settlers moved to the fringe of civilization they left behind their principal medium of communication, the small town newspaper which had become a distinct feature of colonial life.

The loss of any given number of animals beyond the confines of the settlement would have been more keenly felt, but would less likely have been a cause for concern in town — even when the facts became known. The early newspapers are full of notices of strayed or stolen animals — for which there was some hope of return. Anything approaching an adequate concept of contagion, however, did not exist, and the loss of animals under conditions that otherwise might have stimulated an

inquiry into the cause more often than not may have been accepted as one of the risks to be hazarded.

Taking the early reports at face value, it would appear that extremes of climatic conditions took a larger toll of animal life than did disease. In these cases, however, the death of animals might be considered as an observable result of a cause which was all too apparent – to the journalist in town as well as to the farmer who sustained the loss. In addition, seasonal alterations of the atmosphere, as well as major meteorological phenomena per se, were considered as one of the principal causes of disease. This idea, which is a legacy of the ancient concept of air as one of the four elements having a fundamental relation the production of disease, was a strong deterrent to rational investigation of the causation of disease until well into the nineteenth century. Concerning the increasing occurrence of animal disease in America toward the end of the eighteenth century, Noah Webster, in his *History of Epidemical and Pestilential Disease* (1799), says, “These phenomena indicate an unhealthy state of the elements.”

Webster and Fleming

Webster's work constitutes one of the best sources of information on contagious diseases of both man and animals in early America. That it can be considered authoritative may be adduced from the fact that it has been called the most important medical work ever produced by a layman. In attributing contagious disease to elemental conditions, Webster may have fallen short of the mark made by some of his predecessors, but it should be considered that he has given us an educated estimate of the consensus of the “experts” of his time. Both this and his record of the occurrence of disease make his work an invaluable reference.

Another major chronology of animal disease in eighteenth-century America – taken in part from Webster – is the work on *Animal Plagues* (1871), by the British veterinarian, George Fleming. That the rec-

ord as compiled by these two authors gives us but a disconnected picture of the animal disease situation is all too apparent, however. This fact was noted by Cotton Tufts in the *Memoirs of the American Academy of Arts and Sciences* for 1785. Writing on “the Horn-Distemper in Cattle,” a disease which was to become widespread in the mind of man during the ensuing century, Tufts opines:

Beasts of the forest, guided by the dictates of nature, and uncontrolled by man in their food, air, exercise and rest, are seldom affected with any disease, whilst in almost all countries, the domestic kind, that are more immediately under the government of man, are subject to a variety.

He goes on to state however, that “scarcely an instance in this country of reigning sickness among tame or wild beasts, has been noted by its historians.”

The first epizootic to attract the attention of historians was that of catarrh, or influenza, of horses. Fleming records the presence of “horse catarrh in America” in 1699, and again in 1732. The latter outbreak began in New England, prior to a major epizootic in Great Britain, and spread southward to the West Indies, and Central and South America. The course of the disease is said to have been very much like the English outbreak, which is well documented by William Gibson, the noted surgeon-farrier, in his *New Treatise on the Diseases of Horses* (London, 1751). Gibson, who draws upon his personal experiences during this outbreak, gives a faithful account of the disease.

Fleming picks up the thread in 1766, when:

Horses and horned cattle died in great numbers in America, especially in New England and New Jersey. . . . This autumn [1767] has been fatal to the horses in America, as well as England and Holland. The distemper there has been attended with fatal effects; in the province of New Jersey, it has carried off almost all their young horses and colts; and in New England the havoc it has made is also very ruinous.

And in 1768: “horses were generally affected with a disorder of the head and

throat, which proved fatal to many, and much injured the serviceableness of those that survived." Beyond a heavy mortality among horses in Maryland in 1789, nothing further is noted on this disease until 1808.

Webster records much the same information regarding this "epidemic catarrh," and by inference relates the one outbreak to the fact that "the summer of 1768 was hot." He gives frequent accounts of severe drought, floods, cold, heat, and "blasting" of corn, all of which must have had some effect upon livestock—which for the most part were left exposed to the elements—but he has little to say on this matter. Inasmuch as even relatively mild outbreaks of animal disease in England and on the continent are frequently mentioned, it seems likely that Webster would have recorded similar occurrences in America if data were available. He does mention that in 1789, "In Maryland, the autumn was distinguished by an unexampled mortality among horses."

On the matter of the elements, Webster notes that the winter of 1717 "was terribly severe, and remarkable for prodigious storms of snow." In Connecticut a flock of 100 sheep was buried under 16 feet of snow for 28 days; two were alive when dug out. And the winter of 1740–1741 "was of the severest kind. Many cattle perished for want of wood." Not only was this of sufficient moment to merit notice in the *Journal* of the New York Assembly, but Benjamin Franklin, in *The General Magazine* for 1741, published an account of the winter in Maryland:

There has been the hardest winter that ever was known here by the oldest person. . . . In the Country, some have been froze to Death: One Man near the Town, was much eaten by the Hogs . . . and it was imagin'd that the Hogs got foul of him before he was quite dead . . . [an] abundance of Cattle, Hogs and Sheep have perished already, and more daily are perishing.

A major crop failure in 1788, mentioned by both Fleming and Webster, reduced the hardy Vermonters "to the necessity of feeding on tad-poles boiled with pea-straw.

. . . Cattle perished in considerable numbers." Webster further notes:

The winter of 1798–9 was very long and severe. . . . This long duration of cold exhausted all the barns of hay and other fodder, and multitudes of cattle perished in various parts of the country.

Dog and Cat Distemper

According to Fleming, the first occurrence of distemper in dogs anywhere in the world was in South America in 1735, but the disease appears to have been known earlier. The date of its introduction in the American colonies can only be approximated: Cotton Tufts, writing in the *Memoirs of the American Academy of Arts and Sciences* for 1785, states: "About twenty-five years past an epidemic distemper prevailed among dogs, and occasioned a great mortality." This would place the date about 1760. About the same time the disease broke out in Europe, apparently following a path from Spain to England. In 1767, Fleming states, "The distemper in dogs was so violent in Louisiana, that the greater part of them died."

Cat distemper, which Fleming calls "an extraordinary epizooty . . . which appears to have been developed in America," made its first appearance in 1796 in New York City, where some 4,000 cats are said to have died. The following year 5,000 cats perished in Philadelphia. As described by Fleming:

The animal . . . usually lost its appetite, but drank a great deal, slept much, looked very ill, and many began to grow emaciated. Some died in a kind of stupor; others, on the contrary, towards the termination of the disease, became mad, vomited, and foamed at the mouth.

The disease spread rapidly over most of Europe, where cats also died by the thousands. Concerning its spread in America, Webster states:

The cat-distemper appeared in Philadelphia, as early as June [1797] and proceeded northward and eastward, like the catarrh of 1789. In August it was very fatal in New York, and in the course of the summer and autumn, it spread destruction among those animals over the Northern States.

Certain of these outbreaks coincided with the appearance of yellow fever in man, and attempts were made to link the two diseases by incriminating the cat as the reservoir of the disease in man. Nor were dogs exempt from suspicion, for Fleming states: "Also among the dogs, at the beginning of the yellow fever, there was a sickness of which many died." And during an outbreak of yellow fever at New Orleans in 1822: "it was observed that the dogs suffered from the black vomit." The epidemiology of yellow fever, of course, was a mystery at the time, and remained so for many years.

Gallinaceous Gapes

Gapeworms in poultry evidently became well established during the late eighteenth century, for in 1798, a Dr. Wiesenthal, Professor of Anatomy at Baltimore, wrote:

There is a disease prevalent among the gallinaceous poultry called gapes, which destroys eight-tenths of our fowls and occurs in the greatest prevalence among young turkeys and chickens bred upon old established farms. Chicks and poults in a few days after they are hatched, are found frequently to open their mouths wide and gasp for breath, at the same time sneezing and attempting to swallow. At first the affection is slight, but gradually becomes more and more progressive until it ultimately destroys. Few recover: they languish, grow dispirited, droop and die. It is generally known that these symptoms are occasioned by worms in the trachea. I have seen the whole wind pipe completely filled with these worms and have been astonished that the birds could breathe under such conditions.

In severe cases, Dr. Wiesenthal recommends surgical removal of the worms; in others, insertion of a feather into the trachea may dislodge them. The parasites removed, he cautions, must be destroyed to prevent further contamination of the ground, and chicks and poults should be raised on ground to which fowl had not had access for at least a year. Unfortunately, for many decades poultry raisers poked feathers down the throats of birds without realizing the greater wisdom of this early observation regarding area sanitation.

During the nineteenth century "the gapes" became one of the most perplexing problems of farm folk, whose flocks — large and small — were decimated by this parasite. What appears to have been another disease caused great mortality among geese and other fowl in the 1790's, concerning which Webster says, "I have not been able to obtain a particular description of the symptoms, but it was observed the transition from apparent health to death, was very rapid." The symptoms of gapeworm infection, of course, are quite apparent, and were known at this time. The *Maryland Journal and Baltimore Advertiser* in 1779 carried an advertisement for:

The Poulterer's Friend: A certain preventive of Gapes in chickens and turkeys . . . [it] will stimulate the growth of young Fowl, and will prove very beneficial in preventing the ravages of chicken cholera. It is estimated that $\frac{3}{4}$ of the young chickens die of Gapes, which has hitherto baffled every effort to cure. Ask for the "Poulterer's Friend" and take no other article. Already half a dozen worthless imitations have been put on the market.

Mad Dog

The first notice by Webster of disease in dogs is mention of "some cases of canine madness" in 1769 — so far as Webster could discern — the first occurrence of rabies in America. The historical archives of Virginia, however, indicate the presence of the disease in the colonies as early as 1753. Two centuries earlier rabies spread by vampire bats reputedly spread havoc among the conquistadores of New Spain. And, as noted elsewhere, the casual reference of George Washington to rabies in 1769 suggests some familiarity with the disease. Fleming notes that rabies was "very common" in Philadelphia and Maryland in 1780. Webster makes no further reference to rabies until 1785, when:

In America canine madness began to rage and spread in all parts of the northern states. The gazettes of 1785 abound with accounts of the dreadful effects of this singular disease. It will be remarked that epidemic madness of dogs is one of that series of diseases which belong to every pestilential period. Whenever the

human race are generally afflicted with epidemics, the canine species rarely escape the effects of the general principles; and not infrequently foxes, wolves and other wild animals, experience its malignant effects, and run mad.

Sporadic cases in man, and rabies in epizootic proportions among animals are mentioned by Webster several times between 1785 and 1800, who argues:

These phenomena indicate an unhealthy state of the elements. . . . What I denominate a *pestilential principle*, does, at certain times, pervade not only the element of air, but the water also. The proofs of this are abundantly numerous and convincing. . . . The pestilential principle has extended to every species of life. The beasts of the field perish with deadly epidemics; the fish die on the bottom of rivers and the sea . . . while corn is blasted on the most fertile plains.

These phenomena excite the astonishment of men, who have not attended to the history of pestilence, in which they might have found the means of solving the difficulty; for similar facts have marked the progress of pestilential diseases, from the days of Moses to this hour.

To illustrate his thesis, Webster quite correctly states:

In the long sieges, bad food is often a powerful cause of disease . . . [and] whenever grass is defective in wholesome, nutritious qualities, horses, horn-cattle and sheep are sure to suffer by mortal distempers.

Public Health Pundit

On the subject of public health, Webster was considerably ahead of his time. Among several suggestions for improved sanitation in cities, he suggests that the privies — outdoor plumbing, of course, being the rule — be placed at the back line of lots where they might be connected to a conduit to lead the wastes away. Also:

All dead animals in a city or its vicinity, should be buried or burnt; as cats, dogs and horses. The indecency alone of suffering their carcasses to putrefy before the eyes of mankind ought to make it a strict article of police, to remove them. But they should be buried; not one should be permitted to offend the eyes or nostrils of a citizen. They are offensive to decency, to moral sentiments and to health.

He states that in New York City, "from

twenty to thirty worn-out cart horses die and putrefy in the suburbs of that city, every year."

Concerning a matter more directly related to veterinary public health, Webster continues:

If animals, which constitute a part of the food of men, are subject to epidemic distempers, they cannot be eaten with safety, while affected by disease. When fish or fowls are sickly and many of them die, or become lean, the fact should be ascertained by the faculty or a board of health, and public notice should be given, that people might avoid using them as food. In some instances, fish are so sickly as to excite nausea; in which case the use of them should be forbidden.

In a similar vein, the colonial physician, Benjamin Rush, urged in 1807:

It is our duty and interest to attend in a more especial manner to the health of those domestic animals which constitute a part of our aliment, in order to prevent our contracting disease by eating them.

The Suffering South

Animals in the deep South had their share of troubles during the eighteenth century. Of the first cattle — a few heifers — brought to Florida in 1520 by Ponce de Leon, it has been noted that there is no trace of their increase, if any. More than likely they were eaten by the exploring party or lost to the Indians. Nor is there any assurance that those brought by De Soto in 1539 enjoyed any better fate. St. Augustine, the oldest city in the United States (1565), early became a center of missionary work among the Indians — who returned the favor by almost continual harassment of the colonists and their cattle for the two centuries Florida remained under Spanish rule. Dacy, in his story of *Four Centuries of Florida Ranching*, speaks of the precarious position of the brotherhood because of Indian attacks from one side, and pirate raids on the other:

Apparently the beef produced by the dons never supplied the home demand, as in 1712 the St. Augustinians were forced to eat horses, cats, and dogs to keep alive.

The stock liberated by the Indians from the colonists became the foundation of large herds; indeed, the Indians became the first large ranchers in Florida. By the 1750's, cattle and horses had become plentiful and sold for trifles.

Bartram, in his *Travels Through South Carolina, Florida and Georgia* in 1774, noted:

Indian riders herd large lots of cattle. . . . Though the horned cattle and horses bred in their meadows are large, sleek, sprightly, and as fat as can be, they are subject to mortal diseases. I observed several of them dreadfully mortified, their thighs and haunches ulcerated, raw, and bleeding, which, like the mortification of slow cancer, at length puts an end to their miserable existence. The traders and Indians call this disease water rot or scald, and say that it is occasioned by the warm water of the savannas during the heat of summer and autumn when the creatures wade deep and feed on water grasses of which they are immoderately fond; whereas the cattle which only feed and range in the high forests and pine savannas are clear of this disorder.

The Iberville colony of Louisiana, founded about 1700, imported cattle from Santo Domingo, and by 1708 had increased its holdings to about 1,500, and to 10,000 by about 1750 when most of the cattle died of a "mysterious malady." Slaughter of beef was subsequently prohibited until there had been an adequate increase, as was traditional upon the founding of a new colony.

In all too many instances, the identity of these "mysterious maladies" is destined to remain as unknown to us as to those who were troubled by them, for all too often nothing is said concerning symptoms or course of the disease — except for its termination. Thus the nature of "the distemper" or "murrain" often can only be surmised, although these terms were usually reserved for frankly contagious or infectious diseases. At times such diseases were alarming enough to warrant legal interdiction. A proclamation of the governor of South Carolina in 1744 was issued:

Ordering and commanding all persons whatsoever in this province, who have any black cattle amongst which any appearance of this

distemper hath been, or shall be, to keep all their cattle within their enclosed grounds.

This "distemper" apparently raged for some years, for data from the files of the Charleston (South Carolina) Library Society indicate that in 1741 there was "great mortality among cattle," and in 1744 "infectious distemper in cattle in various parts of the Province. . . . Whole herds destroyed . . . large boils full of corruption near kidneys in opened carcasses." The proclamation above most likely was in consequence of "An act to prevent the spread of infectious distemper," in 1744. During 1745 and 1746 numerous cures and means for control of the disease appear in the newspapers; there were those who were sure they could "stop further spreading of infection," or cure it with such items as "a snuff of leaves of the broad-leaved Heart Snake Root." How long the disease raged, or how far it was spread, is not indicated, but in 1762 it is noted: "Murrain has recently appeared in cattle in Va.," and in 1773: "The murrain has appeared in several parts of S.C." On November 13 of the latter year, Wm. Bull, Lt. Gov., issued a proclamation: "announcing the appearance of murrain and cautioning against purchase of infected cattle and against driving from infected ranges."

Nor were the horses of South Carolina exempt; in 1767 it was noted: "Distemper among horses seems to be the same as appeared in the Northern Provinces." This apparently was influenza, which was widespread about this time throughout the colonies. "Cure" of the disease could be effected:

by bleeding plus a ball of brimstone and salt-petre; inject sharp vinegar into the nostrils and bathe the outside of the throat with vinegar, hogs lard and camphor. Tar on bridle bits is a good preventive.

Rabies appears to have invaded South Carolina in 1772; on February 20 there was "a fatal case of hydrophobia in a mulatto boy in Savannah," which occasioned the statement that the disease was "until now almost totally unknown in the Southern

Provinces." Acting with alacrity, on February 25: "Gov. James Habersham issued a proclamation that all in Savannah keep their dogs confined." The report in 1790 of "a recent fatal case in a white lad of 14, six weeks after he was bitten," suggests that rabies was not unknown during the interim. A week after this last incident a city ordinance was passed "placing a tax on dogs." How effective this may have been, or for how long, is a moot point, for in 1800 there are reports of "several persons bitten by mad dogs in the streets."

Thus it is likely that if the full details were available, the record of animal disease in one part of the country at this time would not have differed greatly from that in any other. A thorough search of colonial documents undoubtedly would do much to enlarge the presently rather scanty records of the incidence of infectious disease among the animal population. In some areas at least, the apparent immunity to animal disease might well be related to the inadequate reporting — or failure to ferret out all that has been recorded. But the colonial period is not unique in this respect.

A "Bill for Preventing Infection of the Horned Cattle" was introduced in the General Assembly of Virginia in 1785 and passed the same year. This stipulated that cattle could not be driven into or through the commonwealth without a bill of health signed by two disinterested freeholders, who: "shall have viewed the cattle and reported them to be free from distemper." Infected cattle were to be impounded; if they escaped or were removed without proper certification, they were to be slaughtered and

their carcasses, with the hides on, but so cut or mangled that none may be tempted to take them up and flay them, to be buried four feet deep.

Failure to comply made the owner liable to a fine of 20 shillings per head. This "distemper" may well have been Texas fever; although nothing in the bill suggests it, this disease was already present in the South. Other legislative acts more obvi-

ously aimed at halting spread of this disease are considered elsewhere.

Hollow Horn vs. Hollow Belly

No account of animal disease in the eighteenth century would be complete without mention of the so-called "hollow horn" of cattle, also termed "horn distemper," or "horn ail." This "disease," which seized the imaginations of the intelligent as well as the gullible, seems to have made its first appearance about 1770. For nearly a century the literature on animal disease was replete with methods of diagnosis and cure of this affliction. In 1785 it was deemed of sufficient importance to be given space in the *Memoirs of the American Academy of Arts and Sciences*, but the learned Cotton Tufts could offer nothing not already known by every farmer. A traveller in Pennsylvania in 1794 notes:

Horn'd Cattle in this Country are very subject to have rotten Horns, always the cause of speedy decay & death unless soon healed. As a remedy they either cut them off, or bore a large hole & pour into it Brine, or Vinegar, with Pepper & Salt in it. This passes down through the Nostril & generally cures. They now burn the sprouts of Calves horns when two Months old & then the Horns will not grow.

By inference, at least, this latter measure appears to have been an excellent preventive; but more important, this casual observation dates this practice — for whatever the reason.

References to this disease, once an agricultural periodical literature was established in 1819, would fill a fair sized volume — one that would delight the soul of a gimlet-maker. It was not until about 1850 that reason prevailed, and it was realized that this notorious scourge coincided with a period when poor feeding and general neglect of cattle were as notorious but less well recognized than the easily detectable consequence. In 1847, the noted agriculturalist, Lewis Allen, in his little book on *Domestic Animals*, opined that hollow horn was "usually hollow stomach due to hard work, poor food, or exposure to cold." Some comfort was afforded the gimlet-wielding fra-

ternity, however, for if it were a “true” case of hollow horn, the customary boring, with the salt, soapsuds, or vinegar treatment was advised. It is of some interest that in a recent discussion (1958) of the “downer-cow” syndrome, it was stated, “our main problem with ‘downer’ cows is from ‘hollow belly,’ ” and, (with tongue in cheek), in Georgia, “cows become puny and have hollow horns and tails from the causes mentioned.”

That hollow horn was related to poor winter feeding is suggested by a letter from a Civil War soldier to his wife in Michigan. Dated “Camp near Alexandria, Va., Jan. 31, 1863,” the pertinent passage reads:

You may do as you think best about selling Pink. But I bleave I would sell her before next winter that is if she is going to have the hollow horn every winter.

While hollow horn appears to have been indigenous to America, the equally notorious “wolf in the tail” had its roots in Britain, and earlier in Germany where *Wolf* meant an ulcer. How much improvement had occurred in the handling of this condition in three centuries of thought — or lack thereof — upon the matter may be aduced from the rustic doggerel of Thomas Tusser in 1576:

Poor bullock with browsing and naughtily fed,
Scarce feedeth, his teeth be so loose in his head;
Then slice ye the tail where ye feel it so soft
With soote and with garlicke bound to it aloft.

The Practical Stock Doctor, in 1920, directs:

When a cow or steer gets sick and begins to lose flesh, examine the tail, and if at the end of the tail bone it seems hollow or flabby, split the hollow and fill it with common salt, then wrap with a rag saturated with turpentine. This will be all the attention necessary.

The equally apocryphal “loss of cud” caused numerous animals to have anything from dung to dirty dishrags forced down their throats.

In the same category as the above was the commonly diagnosed “black teeth” of hogs. Speaking of pioneer conditions in Pennsylvania, a historian notes:

Hogs were starved in winter and the result was considered a disease and called “black teeth.” The remedy was to knock out the teeth with a hammer and a spike; if the critter recovered, the remedy was the right one; if it died, the reason given was that the remedy was too late. A far better remedy would have been a bucket of warm slop, a tight stable and plenty of hay.

Little appears to be on record concerning the activities of farriers as such during the eighteenth century — and in many cases perhaps the less said the better. One item of particular interest may be the first record of a woman carrying on this trade, usually reserved for stout-hearted men. The following advertisement appeared in the *Boston Gazette* in 1767:

This is to give notice that the Widow Hendry, having had her Workshop destroyed in the late Fire in Paddy’s Alley, carries on the Farrier’s Business on Scarlet’s Warf, at the North End, where she hopes her Customers will continue their Favors to her, in her deplorable Circumstances.

VETERINARY MEDICINE IN THE WRITINGS OF WASHINGTON

The writings of George Washington are a rich source for the historian in almost any area: political, social, cultural, economic, and agricultural, to name but a few. The paucity of veterinary writings as such during colonial times makes the references of Washington to veterinary matters an especially valuable source for the historian of veterinary medicine. As an astute agriculturalist, the thoughts of Washington upon the care of animals may be taken as representative of the best thinking of the times.

There being no graduate veterinarians in America during Washington’s time, and few competent self-taught farriers or cow-doctors, most of the ailments of livestock were attended, or at least supervised, by the owner — or, as was frequently the case, left unattended. Washington makes no reference to professional attention of any sort upon his stock at Mount Vernon — other than horseshoeing — but does mention having his animals treated for various illnesses

while on the road. Of particular importance is the fact that his writings establish the presence of farriers in the Continental Armies; it has usually been considered that farriers were not provided for cavalry troops until reorganization of the Army in 1792. Another subject of veterinary interest is Washington's provisions for military food hygiene.

Throughout his writings, it is evident that Washington expected much of his horses, but at the same time was very solicitous of their welfare. This was true during his youth as well as in his more mature years. On his mission to the French in 1753, he wrote in his diary:

Our horses were now weak and feeble, and the Baggage so heavy . . . that we doubted much their performing it; therefore myself and others . . . gave up our Horses for Packs, to assist along with the Baggage. . . . The Horses grew less able to travel every day.

And in 1755 during the French and Indian War he lamented:

surely no man ever made a worse beginning, than I have; out of 4 Horses which we brought from home, one was kill'd outright, and the other 3 render'd unfit for use.

On several occasions he mentions the difficulty of getting horses, wagons, and forage, and the poor condition of those few horses that were available. On a trip to Winchester in 1755, he wrote:

I met with no other Interruption than the difficulty of gettg. Horses after I found . . . [mine] for want of Shoes grew lame, I was oblig'd to get a fresh horse every 15 or 20 Miles, which render'd the journey tiresome.

And later the same year:

I have been now 6 days with Colo. Dunbar's Corps, who are in a miserable Condition for want of Horses, not having more than one half enough for their Wag'ns. . . . I believe shortly he will not be able to stir at all . . . there has been vile management in regard to Horses.

Mashd Leg a la Markham

On a visit to his home at Mount Vernon in 1760, Washington wrote in his diary:

Upon my return found one of my best Wagon horses with his right foreleg mashd to pieces, which I suppose happend in the Storm last Night by Means of a Limb of a tree or something of that sort falling upon him. Did it up as well as I coud this night. . . . [the day following]: Had the Horse Slung upon Canvas and his leg fresh set, following Markham's directions as near as I coud. . . . [but two days later]: The Broken legd horse fell out of his Sling and by that means and struggling together hurt himself so much that I order'd him to be kill'd.

With a limb "mashd to pieces" it is very unlikely that the horse would have escaped dying from infection, or if it did, that it would have had the use of its leg — a serious matter for a wagon horse (i.e., more serious than for a brood mare). It is also curious that Washington should have shown what must be considered something less than the best judgement in electing to use Markham as a guide — or even to admit owning this particular work. In a footnote to this entry, the editor of Washington's works states:

None of Markham's writings were in Washington's library, but William Gibson's *Treatise on the Diseases of Horses* (London, 1751) had been purchased in 1759, and Jacques de Solleysell's *The compleat Horseman, or perfect Farrier* (London, 1729) is in the inventory of the library.

Either of these would have been a better choice, and it is perhaps significant that Washington appears to have gotten rid of the Markham. The work referred to undoubtedly is *Markham's Maister-peece* (London, 1610). Despite other shortcomings, however, Markham's section on broken bones is acceptable in some respects. Although he gives appropriate directions for slinging the horse, once this is done, all he says about setting the limb is "then you shall put the bones in the right place," following which bandages and splints are to be applied. Inasmuch as Markham admits that most farriers did not have the skill to set a broken limb on a horse, it may be doubted that much could be expected of an amateur.

It is of some interest that in addition to the copy of Gibson, which Washington ordered from Robert Carey & Co. of London in 1759, he also specified six bottles of Greenhow's Tincture (probably a horse liniment), and "2 pr good Horse Scissars." And later he ordered:

40s. Worth of Medicines for Farriery, among wch let there be

4 lb. flower of Brimstone	5 lb. black Soap
4 lb. Anniseeds	5 lb. Cummin Seeds
4 lb. Carthamus	4 lb. Fenugreek
5 lb. Syrup of Colts foot	2 lb. juice of Liquorace
2 lb. Diapente	4 lb. long Pepper

These were among the more common ingredients of most animal medicines; it is a commentary on the times that 40 pounds of drugs could be had for as many shillings. While this list does not prove that Washington compounded his own remedies, for each of these was used singly also, he at least showed good judgement in buying simple drug ingredients rather than some of the fantastic compound remedies popular at the time. Some of these contained from 50 to 100 ingredients; the diapente ordered by Washington, as the name implies, contained five.

In 1762, Washington wrote to George William Fairfax concerning the death of a mare belonging to the latter that apparently had been sent to Mount Vernon for breeding. The mare had been well when let out of the stable in the morning:

but before Night was swelled to a monstrous size and died in a few hours. Bishop (my old Servant) opened her but could perceive no hurt, bruise, or other apparent cause of so sudden a death, which Inclines me to think it was occasioned by eating blasted Corn. . . . She had no Foal in her, which assures me she never would Breed, as I am convinced she had a competent share of Ariel's performances.

This occurred during Washington's absence; evidently his servant had been sufficiently well instructed to proceed with a post-mortem examination without specific directions. While not much, perhaps, might have been expected under the circumstances, it is at least significant that

such examinations of animals which died apparently were done as a matter of course. Washington's surmise over the probable cause is certainly as good as any that might be made, and shows that he had some familiarity with the digestive troubles of horses.

Hard on Horses

As an owner of fine horses, Washington insisted upon the best care possible for them. As a rider, he was solicitous of the well being of his mounts, but it is apparent that he expected much of them, for he makes frequent mention of having foundered his horses while on a journey — a serious matter when horses were so depended upon. Thus in 1769 Washington notes that he: "Got to Eltham, after foundg my Horse," and listed: "Expences of my Sick Horse 15s." And in 1770:

Began a journey to the Ohio . . . and lodgd at Leesburg distant from Mount Vernon abt. 45 Miles. Here my Portmanteau Horse faild in his Stomach.

After traveling another 30 miles the day following, he notes: "My Portmanteau Horse being unable to proceed, I left him at my Brother's." Again, in 1771 he was forced to make: "some considerable stop at Ruffin's Ferry, occasioned by a Sick Horse," and lists expenses of 10/3; and upon another occasion in 1772, the self-accusation "Foundered two of My Horses," appears. While a good horseman might consider himself at fault if his horse were to be foundered, not infrequently this trouble would be a direct result of the poor condition of a borrowed horse, or poor facilities for care on the road. The inconvenience occasioned by lamenesses is suggested by a note from Washington to the Reverend Jonathan Boucher in 1772:

I send my Carriage up but cannot undertake to promise for the Horses bringing you down . . . with my lame Horses not being return'd from Williamsburg.

Some idea of the attention Washington paid to his horses en route may be had from his diary for 1791:

At the Red Lyon we gave the horses a bite of Hay — during their eating of which I discovered that one of those wch. drew the Baggage waggon was lame and apprd. otherwise much indisposed — had him bled and afterwards led to the Buck-tavern. . . . [and the day following]: The lame horse was brought on, and while on the Road apprd. to move tolerable well, but as soon as he stopped, discovered a stiffness in all his limbs, which indicated some painful disorder. I fear a Chest founder. My riding horse also appeared to be very unwell, his appetite had entirely failed him.

The self-imposed schedule Washington made for himself upon a trip explains much of the trouble he had with his horses. In fact, until the relatively recent combination of good automobiles and good roads, his schedule would not have been an easy one to follow by car. At the age of 59 on a journey from Augusta to Columbia (Georgia) in 1791 (today a distance of 74 miles via U.S. Route 1), Washington travelled a distance of 49 miles on May 21, and 48 the following day — 21 miles of which were made before Sunday breakfast. This day he wrote:

The whole Road from Augusta to Columbia is a pine barren of the worst sort, being hilly as well as poor. This circumstance added to the distance, length of the stages, want of water and heat of the day, foundered one of my horses very badly.

At Columbia on the twenty-fourth he added: "The condition of my foundered horse obliged me to remain at this place, contrary to my intention, this day also." On the twenty-fifth he resumed his trip: "the foundered horse being led slowly on," and on the thirtieth: "This day I foundered another of my horses." And on another trip in 1795 a horse overcome with heat was led for a day, following which, "My sick horse died."

Eminent Agriculturalist

On agricultural matters, Washington may be considered one of the first experimentalists in America, and he conducted his farming enterprises at Mount Vernon in a manner quite unknown to the great majority. His philosophy is summed up

in a letter to Arthur Young, editor of the *Annals of Husbandry*:

The System of Agriculture (if the epithet can be applied to it), which is in use in this part of the United States, is as unproductive to the practitioners as is ruinous to the landholders. Yet it is pertinaciously adhered to. To forsake it; to pursue a course of husbandry which is altogether different and new to the gazing multitude, ever averse to novelty in matters of this sort, and much attached to their old customs, requires resolution: and without a good practical guide, may be dangerous; because, of the many volumes which have been written on this subject, few of them are founded on experimental knowledge, are verbose, contradictory, and bewildering.

With regard to experimental animal husbandry, Washington is best known for having introduced the breeding of mules. While at least a few mules had been brought over from Europe, apparently no serious attempts to breed them here had been made. Writing to a shipowner friend in 1784, Washington requested him to secure a good Spanish jack: "whose abilities for getting Colts can be ensured." Washington expressed concern over a story he had heard that jacks exported from Spain:

very frequently have their generative parts so injured by squeezing, as to render them unfit for the purpose of begetting Colts, as castration would, when from a superficial view no imperfection appears. Whether the latter is founded in truth, or mere report, I do not vouch for; but as I would have a good Jack or none, I am induced to mention the circumstances.

It was the custom in Spain to crush the testicles of jacks considered unfit for breeding, and apparently there was some suspicion that the same was done to those exported to prevent other countries from obtaining foundation stock from their justly famed breed.

Royal Gift

Pursuant to Washington's request, a jack fulfilling his requirements was secured, but delivery was refused because of the exorbitant price. The following year two jacks were sent to Washington as a gift from the King of Spain; one was lost in a storm at

sea, the other arrived after a hazardous journey from New York and was named *Royal Gift*. Four months after arrival Washington wrote his brother that *Royal Gift*, "seems too full of Royalty, to have anything to do with a plebeian race; perhaps his Stomach may come to him, if not, I shall wish he had never come from his Most Catholic Majesty's Stables." In 1786 Washington received a gift of a jack and two jennets from the Marquis de Lafayette. The jacks were used extensively at home and about the countryside, but the mule-breeding business was not without its pitfalls. In 1788 Washington mentions that many foals were lost by abortion, which he attributed to scanty feed as a result of a poor crop year.

That the loss of his foals may have been due to contagious abortion, however, is indicated by frequent reports of losses. But this disease had not been recognized as an entity at this time; thus it is not unusual to find the losses attributed to a variety of causes. In 1793 Washington had no doubt that excessive riding at night was:

the primary cause of my loosing a number of horses; the poverty of others, and the slinking of foals which happens so frequently that I make a miserable hand of breeding Mules.

Later he states: "almost all the Mares had slunk their foals." Nor were animals immune from various other troubles; in 1797 he lamented:

I am unlucky in the loss of Mules; not less than five or Six within two, or at most three years, have died by violent means. . . . [And earlier]: I believe no man is more unlucky in the deaths, or in the accidents to Horses than I am; for I am continually loosing them by one means or another.

Suffering Sheep

Sheep, which Washington considered "that part of my stock in which I most delight," also suffered, primarily as a result of his enforced absenteeism from Mount Vernon. This Washington well knew, for he stated in 1798:

My Stock of all sorts has been much neglected during my eight years residence from home, and will take more time than in the usual course of Nature will be allowed me, to improve them much.

His sheep, however, had been subject to various troubles over a long period. In 1772 he wrote the Reverend Jonathan Boucher:

I find upon enquiry that, it will not be in my power to supply you and Mr. Calvert with the Weathers you want; the Rot, or some other distemper among my sheep swept off near an Hundred, in the Space of a Month, this Spring for me.

During the war years his stock deteriorated greatly, but Washington had little time to devote to his farming operations, and only one reference, to the possibility of distemper in his cattle in 1778, appears in his writings. During his tenure as President, much of his contact with Mount Vernon had to be by correspondence.

In November, 1793, Washington wrote his overseer:

I am sorry to find that scarcely any report comes to hand without mentioning the death of several Sheep. If the Overseers begin thus early to report deaths, what may I not expect to receive between this and May? . . . [and later]: Let Mr. Crow know, that I view with a very evil eye the frequent reports made by him of Sheep dying. When they are destroyed by Dogs it is more to be regretted than avoided perhaps, but frequent *natural deaths* is a very strong evidence to my mind of the want of care, or something worse.

To counteract this evil, Washington requested reports on every lamb dropped, and on: "*every* one that dies; that I may be able to form a just opinion of the care and attention they pay to this business." And in 1794:

As I am constantly loosing Sheep I wish, this year, you would cull them closer. The flock would be benefitted thereby, whilst I might get something for the refuse; instead of the frequent reports of their deaths.

To his overseer again in 1797, Washington wrote:

I hope, at your last shearing, there was a complete cull, separation of all the old, scabby and disordered Sheep. I do not know how to account for the weekly loss you sustain, in this species of Stock, unless it be by keeping such poor and diseased sheep in the flocks as to contaminate others.

Thus, although he was not notably successful in achieving the desired results, Washington recognized the necessary steps to be taken to reduce his losses: adequate records, culling of poor animals likely to become diseased, and avoidance of contagion by removal of those suffering from disease.

War Horses

During the Revolutionary War fewer horses than might be supposed were used in combat. Those officers who had private mounts usually had to provide them for themselves, and frequently forage was too scarce to support even those horses which were required to haul provisions. Thus in 1776 Washington wrote to Colonel Thomas Seymour:

There is not more forage on hand or to be had than is absolutely necessary for the Use of our Working and Artillery Horses, and . . . it is my desire your Men may be halted some way in the Rear of this place, and their Horses sent back, otherways the Men can only be a stop and a check to the service, as they cannot act as Horse Men in case of Action, or if they could forage would not be found to support them.

This scarcity of forage was equally a disadvantage to the British; in 1777 Washington wrote:

The Enemy's want of Forage compells them to send out very large Parties to secure it, those are always beat in, with some Loss. Their draft and Artillery horses die fast; and now that I have brought all the useful ones from their neighborhood I think they will meet with much difficulty in advancing.

Want of forage was not the only trouble. Despite a series of orders directing proper shoeing, feeding and usage of horses, mismanagement appears to have been the rule. Military horses were used for nonmilitary

purposes, and were misused in the service. In 1777 Washington issued a general order:

The Horses belonging to the Artillery are not to be used under any pretence whatsoever, but for the purpose for which they are designed. . . . The commanding Officer of Artillery is to take care that their horses Shoes are kept in good order.

And in a letter to Major General Thomas Mifflin: "It is more than probable that, in the course of service, many horses will be so worn down as to render it beneficial to the public to have them sold. On one occasion General Putnam reported the death of 25 artillery horses from bad usage and the expected death of more.

Despite a continual shortage of wagon horses, the teamsters used them badly, riding them hard when they were not in draft, which caused Washington to issue a general order: "to the Quarter-Masters and Waggon-Masters, to give strict orders against such practices in future." And later:

The Commander in Chief has reason to believe, that it has been owing to the carelessness and inattention of the waggon-masters, in not seeing the horses properly fed and managed, that such great numbers of them have foundered and died.

Of the unavoidable hardships at Valley Forge, Washington wrote that by comparison with the suffering of his men "could the poor Horses tell their tale, it would be in a strain still more lamentable, as numbers have actually died from pure want."

Revolutionary Farriers

Of particular importance in the history of military veterinary medicine is the little-known fact that official provisions were made for including farriers in cavalry troops during the Revolutionary War. Merillat and Campbell state: "Available records do not show any veterinary surgeon as being on duty with the military forces of the United States during the Revolutionary War." Moreover:

The first provision made for mounted troops was by Act of Congress, March 5, 1792, which provided for the organization of one squadron of light dragoons of four troops. For each troop was authorized one farrier.

This is usually considered the beginning of our military veterinary arm.

As Commander-in-Chief of the Continental Army, however, the decisions of Washington were as binding at the time as the acts of the Congress were later. On December 16, 1776, Washington appointed Colonel Elisha Sheldon commandant of the Connecticut Regiment of Horse, and directed:

Your Regiment is to consist of One Major, an Adjutant, Surgeon and Mate, and Six Troops; to each Troop, One Captain, One Lieutenant, One Cornet, One Qr. Master, two Sergeants, two Corporals, One Trumpeter, One Farrier, and thirty four privates.

And in 1777 Washington directed the formation of "a Company of Artificers enlisted during the War, to be attached to the Artillery in the Field." This company of sixty men skilled in various crafts included a master blacksmith and 15 smiths, and two farriers. The number of smiths would suggest that horseshoeing was to be in their province (as it was at Mount Vernon), and that the farriers were to be employed more as veterinary practitioners. However, in the recommendations drawn up by Washington in 1798 for reorganization of the Army, he suggested one blacksmith per troop of dragoons, but made no mention of a farrier — already provided for by Act of Congress in 1792.

As evidence that farriers actually served during the Revolution, in a communication to the Pennsylvania Board of War in 1777, Washington mentions one Joseph Fox, identified as a Light Horse farrier. In regard to a Mr. Hughes, suspected of being connected with spying activities, Washington wrote, "I shall enquire into his political Conduct for some time past, and if I find the least Grounds for a belief, that Fox's testimony is true, I shall have him apprehended."

That other veterinary practitioners served in the Revolutionary War is indicated by a correspondent to the *American Farmer* in 1830, who in offering a remedy for bots in horses, states that it is one he has used, "for more than half a century with invariable success." The remedy, consisting of a drench of milk, salt water, and linseed oil, is of less interest than its source. He says:

I received it from a German veterinarian, who came to this country with the Baron Steuben, and was attached, as farrier, to the general staff of the main army, in the years 1778 and 9. He may be remembered by some of the military gentlemen of that day, under the dignified appellation of Count Saxe, a *nom de guerre*, given him by the Baron, on his entering our service. He was a man of great skill and celebrity in his profession.

Of even greater interest from the standpoint of military veterinary medicine is Washington's attention to food hygiene, considered in an earlier section.

It is evident that Washington's passion for detail extended to matters which would today be considered in the veterinary domain. There is no inference, however, from his writings that he gave any overt thought to these matters as being the concern of anyone other than a good farmer or a military commander. The concept of a veterinary profession was unthought of in America during Washington's lifetime; nor can it be considered that he was particularly obsessed with problems of a veterinary nature. The selections quoted represent a large part of all his thoughts on these matters, gleaned from nearly 20,000 pages of his writings. What is important is that collectively these form the most extensive body of first-hand observations on veterinary matters made by any American prior to 1800, and as such they represent an invaluable addition to the fragmentary history of colonial veterinary medicine.

THOMAS JEFFERSON, GOOD SHEPHERD

Jefferson's writings on animal disease extend beyond the eighteenth century, but are considered here because they form a

natural sequel to those of Washington. Like Washington, Thomas Jefferson was a good farmer, and showed much interest in the welfare of his livestock. And like Washington, he appears to have been more interested in his sheep than other species, if the volume of his writings on this subject is any criterion. This, in part at least, may have been generated by the tidal wave of interest in the Merino sheep, which had been introduced from France early in the nineteenth century. The "Merino fever" resulted in fabulous prices being paid for foundation stock, rams frequently bringing a thousand dollars or more. But like other financial schemes, this bubble broke — for some sooner than might have been surmised.

In 1810 Jefferson wrote to a Joseph Dougherty:

I am confident that sheep will be found to be profitable as soon as you can get a proper stock. The late importation of Merinos will of course reduce the extravagant prices at first given; but they will steadily maintain a price of good profit.

But only two years later, he again wrote:

the Merino fever has so entirely subsided in this part of the country that the farmers now will not accept of them, because they produce less wool & less suitable for the coarse manufactures they want, than the sheep they possess, and there is no market for the wool in this state.

One reason for sheep being unprofitable at this time appears to have been the introduction of scab, and much of Jefferson's correspondence relating to his sheep during 1811–1812 concerns this problem. In March of 1811 he wrote George Jefferson:

The two last Merino ewes have brought the scab into my flock of sheep, which is now generally infected with it. The oil of turpentine is the principal ingredient in the remedy for it, but it would take more than our apothecaries could furnish here, and at their exorbitant prices. Will you be so good as to send me a gallon.

To this, George Jefferson replied:

I really am beginning to apprehend that the introduction of Merino sheep into the Country may prove more injurious than beneficial, as I understand they have communicated the scab to the flock of almost every person who has them. There is danger I suppose of its spreading as other diseases have done, so as never to be eradicated.

Mr. Graham of this place [Richmond] informs me that he thinks he has lately cured it in his Merinos by steeping one pound of Tobacco in a gallon of boiling water, & rubbing the parts affected well, as soon as it cooled. As this remedy must be perfectly innocent (except perhaps with pregnant ewes) would it not be well to make the experiment.

Jefferson mentions that he had lost several sheep from scab, and had:

tried mercurial ointment with no effect. Repeated annointings with brimstone & fat have eradicated it, except in a single subject, now separated. . . . The falling off of the wool and scabs in it's place is the indication, & the ointment immediately rubbed in effects the cure at once.

One of his correspondents suggested:

A strong decoction of Tobacco mixed with some soft soap, & rubbed on them, I think the best mode of killing or curing the Scab: better even than mercurial ointment. Livingston gives a Receipt for it in his Book on sheep.

The book referred to is *An Essay on Sheep*, by R. R. Livingston, the American minister to France. First published in London in 1809, and here in 1810, Livingston's work was instrumental in popularizing the fine-wooled Merino which had been introduced in the United States by Livingston in 1802. While his work presumably deals with sheep and their diseases in America, the section on disease presents nothing new, being taken entirely from older English works. It would, perhaps, be too much to expect an original veterinary work from the hands of a statesman; how the net effect of his book must be accounted is open to speculation. It undoubtedly awakened a new interest in sheep, but by presenting an overly enthusiastic picture of the value of the Merino, it was the undoing of many who became infected with the "Merino fever."

Lunatics in Love

Jefferson himself appears to have been only mildly affected, for he mentions that he had only one ram and three ewes, one of which died of scab. The other two, he complains mildly: "for two years have brought me only ram lambs, so that I remain still with only 2 ewes." Hearing of this, a William Thornton wrote from Washington:

I am sorry you have not been more fortunate in raising Merinos. I informed Judge Cranch, that, if the Ram be put to the Ewes in the increase of the moon, the Lambs would be more generally males, if in the decrease females. He tried this with our joint flock of common Ewes, amounting to about 400: . . . by which he found my statement right in the proportion of 4 to 5 . . . & this appears to be more the case in other Animals. . . . This if true generally, would tend to prove that all animals are lunatics in love.

Jefferson gives no indication as to his concern, or lack of same, over this "lunacy," but he was concerned over other problems of breeding.

Something of an experimentalist like Washington, he had imported a pair of African broad-tailed sheep, which he seems to have preferred for table purposes. He had found, however, "the ewe would never breed, her massive tail never admitting the commerce of the ram." He had, therefore, instituted a program of inbreeding with the ram, and found the same trouble with the ewes when they carried $\frac{7}{8}$ of the original blood. To get around this obstacle:

I had the tails of my young Ewes cut off, and only lost one, which I am confident was by inattention after the operation. I directed them to be laid on their Backs, and the skin of the tail being clipped toward the root, the tail resting on a Block a broad and sharp axe was applied near the root of the tail and by a stroke of a mallet the tail severed at one blow, the skin was then drawn over the stump & sewed to the other on the upper sides, so as to protect the stump, & leave the parts exposed, and thus they are prepared for any cross. This being done in cool weather subjects the animals to very little if any risk.

In addition to the physical obstacle presented by the broad tail, Jefferson states: "A Merino I suppose would be alarmed at such an unnatural mass."

Jefferson's mention of the diseases of other animals is only incidental. On one occasion a horse "became all but blind in both eyes. After about 10 days or a fortnight however they mended, and tho' they are still weak, yet he sees pretty well again." And another horse:

has been occasionally subject to a spasmodic affection like the Thumps which I once thought alarming but am now induced to believe that it is nothing more than Hickup, as it always succeeds a hearty meal or draught of water.

It is evident that Jefferson is describing periodic ophthalmia and heaves. Jefferson's thoughts on the dog problem are discussed elsewhere, as are his legislative efforts to prevent the spread of "Infection of the Horned Cattle."