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### **When Rinderpest was Just Cattle Plague: Agrarian Reform and Public Health Environments in Eighteenth-Century Italy**

On December 29<sup>th</sup>, 1779, Lunardo Nadal, a Venetian governor stationed on the Istrian peninsula (see map), wrote an emergency dispatch addressed to the public health authorities in Venice, the *provveditori alla sanità*.<sup>1</sup> Nadal reported that a *peste bovina* (bovine plague) was raging across the peninsula and requested that the *sanità* ratify a set of emergency quarantine provisions he had already imposed throughout his jurisdiction. Nadal explained that he had mandated that cattle in Venetian Istria remain confined to their stalls for the duration of the infection. He had also forbidden any traffic in animals with the Austrian side of the peninsula, where the outbreak had originated.<sup>2</sup> Nadal had not limited his ban on commerce to live animals. He had likewise decreed the meat, hides, tallow, and all other products of the cattle trade should not cross the border. The *sanità* approved all of Nadal's provisions by immediate return post. In other words, in December 1779 Venice imposed a good old-fashioned quarantine, the public health measure *par excellence* of the early modern period. The only unusual feature of the quarantine is that it targeted a specific domesticated animal rather than people.

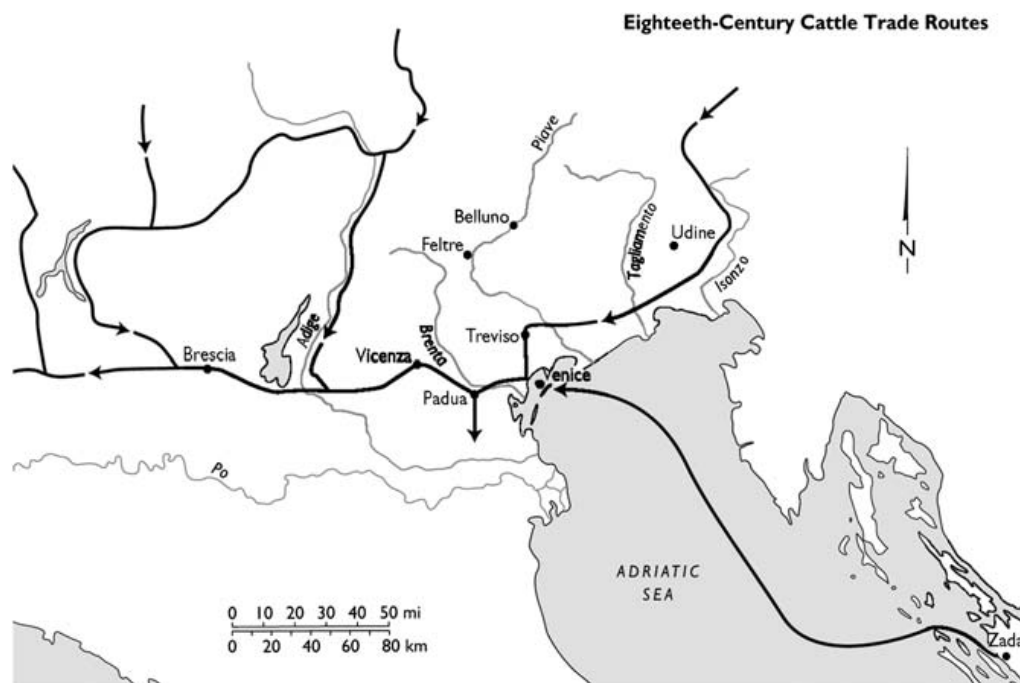
From the very first outbreak of epidemic plague in 1348, public authorities had viewed halting the movement of people and material objects as the first and best

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<sup>1</sup> Archivio di Stato, Venezia (hereafter ASV), *Provveditori alla Sanità*, B. 712, c. 1. The entire Busta

<sup>2</sup> For more on Istria in the early modern period see Egidio Ivetic, *Oltremare: Istria nell'ultimo dominio Veneto* (Venice: Istituto Veneto, 1999).

Figure 1. Eighteenth-century Beef Cattle Routes Into and Out of Venetian Territory.



recourse available. The Pistoia Plague Ordinances, perhaps the best known legal document from the devastating plague year of 1348, specify a number of material objects, including bolts of cloth, that were forbidden to cross the city gates for the duration of the emergency. Naturally not everyone appreciated quarantine restrictions, and regulations were often observed in the breach. The archives of every European state are rife with quarantines broken by everyone from smugglers seeking illicit profits to people intent on making votive offerings at a nearby shrine or witnessing the procession of a powerful relic in a neighboring town in the hopes that it would save them from infection.<sup>3</sup> For European states, then, the fight against epidemic disease was not

<sup>3</sup> The classic study of the struggle to maintain quarantine restrictions is Carlo Cipolla's microhistory of a plague outbreak in a village outside Florence: *Faith, Reason and the Plague in Seventeenth-Century*

just a struggle against the many possible causes of mass illness, but a struggle to control individual and group behavior as well.

In many ways, the late seventeenth and eighteenth-century responses to cattle plagues, or epizootic disease, fit quite well within this narrative. The *sanità* that blocked bovine commerce in Istria in 1779 was the same institution that intervened in the epidemic plagues of 1575 and 1630, and in the syphilis epidemics that ravaged Venice throughout the early modern period.<sup>4</sup> Indeed, the quarantine measures, burial practices, and other strategies employed to combat epizootics were by and large the very same rules that public health officials had long used to limit the spread of epidemics of all kinds. In other words, the quarantine system was an automatic reflex, a well-tested political and medical mechanism that required no debate. Quarantines and their attendant procedures and intrusive inspections by public authority were so ingrained by the eighteenth century that most everyone, however begrudgingly, accepted them as a necessary fact of life. Individuals might obey the rules only selectively, or seek to circumvent particular restrictions for personal convenience or gain, but almost no one questioned the legitimacy of public health provisions.

The 1779 cattle quarantine, therefore, appears to be merely a later, more elaborate, instantiation of medieval and early modern European public health measures—the culmination of centuries of thought and institutional development. Such an impression is, I argue, misleading. If the emergence of epizootic events as a major

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*Tuscany* (New York: W. W. Norton, 1981). There is a substantial and ever growing literature on Italian responses to the plague and other diseases in the middle ages and renaissance. See for example,  
<sup>4</sup> See Laura McGough, *Gender, Sexuality, and Syphilis in Early Modern Venice: The Disease that Came to Stay* (London: Palgrave, 2011).

medical problem in the late seventeenth century appeared to confirm the power of early modern public health institutions and procedures, it also challenged the ideas and procedures that underpinned those institutions and procedures in increasingly important ways. Quarantine might well have been the best available response for both epizootic and epidemic events, but animal plagues turned out to be quite different from the human plagues of the past. Those differences ultimately forced medical thinkers and state officials alike to reassess many deeply held beliefs about medicine, contagion, and public health in ways that epidemic diseases could not.

It is the central contention of this paper that because epizootic (and zoonotic) diseases ultimately proved a poor fit for existing public health institutions and structures, they became a central issue not just in the realm of institutional practice, but in the eighteenth-century medical thought more broadly. That is to say, rather than providing a confirmation for long-established thought and practice, the cattle plagues of the eighteenth-century upended both. For contemporaries and historians alike, the most obvious result of this was the invention of veterinary medicine as a separate professional discipline. What has not been remarked upon is the degree to which this new medical discipline demanded not only new ideas about animal health, but new forms of medical training and a new social role for doctors specializing in the health on non-human animals.

Debates over the etiology and consequences of epizootics also served to draw medical writers and public health officials into realms of thought and practice that had previously lain outside their purview. As beef cattle (which were the primary vector for

most eighteenth-century livestock diseases) became an increasingly important part of the rural economy, physicians interested in epizootic diseases became enthusiastic contributors to debates within the relatively new field of agrarian science. For similar reasons, the health of domesticated animals emerged as an important feature of debates about political economy more generally. The reflections of physicians, public health officials, agronomists and other writers were rarely coherent, reflecting as they did competing priorities—for example the lure of potential profits that might be realized by increasing stocking densities of cattle conflicted with the desire to minimize the devastating economic effects of repeated epizootic and zoonotic outbreaks. In other words, the real and potential effects of livestock diseases on eighteenth-century rural economies placed them at the center of debates in both political economy and medicine. The latter will be the major focus of this essay.

By the beginning of the eighteenth century, few events caused more alarm among public health authorities than outbreaks of epizootic disease. With plague, the scourge of late medieval and early modern Europe, apparently waning and the diseases of exploding urban populations and the industrial revolution (cholera, tuberculosis, et al.) still in the future, cattle plagues took center stage in the minds of public authorities and medical practitioners alike. A brief word on terminology is in order here. In the seventeenth and eighteenth centuries, rinderpest (literally cattle plague) was a generic term that was used in nearly every European language—the Italians called it *peste bovina*, the French *peste bovin*, and so on. For most eighteenth-century medical authorities, cattle plague encompassed a wide range of animal diseases including

bovine pleuropneumonia, foot and mouth, and others (possibly including anthrax) that we cannot now identify with any certainty.<sup>5</sup> Practitioners sometimes used more specific terms—the Venetians and other Italians occasionally distinguished between respiratory ailments, which they called *polmonara* (literally “of the lung”) and varieties of *peste bovina* that attacked other parts of the body such as foot and mouth. Nevertheless, cattle plague remained far and away the most common term for experts and laypeople alike, and was often used interchangeably with more specific terms by the same authors. So for the purposes of this paper, I will use the term cattle plague as the historical actors used it: as a blanket term for a suite of animal afflictions that may or may not be identifiable in terms of our own understanding of particular diseases as discreet biological entities.<sup>6</sup>

In addition to the generic quality of the various eighteenth-century terms for cattle plague, it is worth noting that almost no one who used them seems to have imagined that rinderpest or *peste bovina* was necessarily exclusive to bovines. One of the reasons that cattle plagues generated so much fear in this period is that nearly everyone who was in a position to think about them assumed the diseases could jump from cattle to other animals. In our own terms, eighteenth-century medical thinkers feared that these epizootic diseases might be zoonoses. The list of animals considered to be at risk of contracting variants of bovine plague included sheep, horse, and

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<sup>5</sup> Not all animal diseases have attracted the attention of historians, but there is excellent work on both foot and mouth and anthrax in the modern period, and rinderpest has recently attracted the attention of historians of twentieth-century Africa. For anthrax and foot and mouth see Susan Jones, *Death in a Small Package* (Baltimore: The Johns Hopkins University Press, 2010); Abigail Woods, *A Manufactured Plague* (London: Earthscan, 2008).

<sup>6</sup> Medical historians often disagree about the value of retrospective diagnosis. My own preference is to employ “actor’s categories” whenever possible, rather than attempt to identify specific diseases based on sketchy evidence. I would be happy to discuss the stakes in the q&a.

humans. Moreover, medical thinkers assumed that there were many potential pathways beyond direct physical contact by which infection could travel from one animal to another. Seventeenth- and eighteenth-century authorities usually focused on a range of indirect forms of contact, including the sharing of feed or placing healthy animals in stalls recently occupied by sick beasts. When thinking in zoonotic terms, they identified the consumption of meat as well as the use of other products derived from sick animals as activities that increased the risk that humans might contract these diseases. This was the logic that underpinned Nadal's decision to block trade in hides and tallow in 1779. In some cases, prophylactic measures were even imposed retroactively. So, for example, following an outbreak of sheep plague in 1724, the prohibitions on secondary products was extended to include "all wool sheared in the forty days [literally a retroactive quarantine] before the plague" until it had been "boiled for two days, placed in cold running water for four days, and then dried in direct sunlight" after which public health authorities would deem it safe for sale.<sup>7</sup> When it came to the potential for cross-species transmission, seventeenth and eighteenth-century officials preferred to err on the side of excessive caution. And of course, in some cases—anthrax, hoof and mouth, and rabies for example—the fears that underpinned such precautions would eventually reveal themselves to be well founded.

### **Cattle Plagues in Italy: a Brief History**

Venice was the northernmost hub of the peninsular cattle trade as early as the sixteenth century, but the scale of the trade changed dramatically in the last two decades of the seventeenth century. From an early date, Venetian merchants imported

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<sup>7</sup> ASV, *Provveditori alla Sanità*, B. 709, c. n.n. (26 Agosto 1724).

most of their cattle from the Hungarian plain, which was the site of an ongoing military conflict between the Habsburg and Ottoman Empires. Regular disruptions caused by war, plague, and population decline hampered the Hungarian cattle trade throughout the sixteenth and most of the seventeenth century. The limited scale and unpredictability of the trade meant that while much of the Hungarian livestock that crossed the Alps was fattened and slaughtered in Venice and elsewhere, beef necessarily remained a minor element in the Italian diet. This is not to say that Italy had no cattle. Italians still relied on oxen to pull ploughs and perform other necessary agrarian tasks, and local landowners often kept small dairy herds—especially in central and northern Italy—but local breeding provided most of the replacement animals, and only aged beasts went to the local slaughterhouse. Consequently, foreign epizootics did not pose a serious threat to Italian livestock. However, once the Hapsburgs scored the decisive victory against the Ottomans at the siege of Vienna in 1683, the situation changed. A stable Hungary meant a reliable supply of animals, and the possibility of a regular market for beef cattle employing the already existing trade routes into Venetian territory.

The Venetian cattle trade was a vast and complex enterprise. Imperial and Ottoman merchants alike had been organizing cattle drives from the Hungarian plain to Venice for several centuries, but the scale and purpose of the trade changed drastically at the close of the seventeenth century. Herders in the employ of Imperial owners regularly drove small herds of between 100 and 200 head of cattle from the Danube up the Saba River and down the Isonzo River. The terminus of the route was the town of Marghera on the shore of the Venetian lagoon, where the cattle were weighed, and a Venetian



*partitante pubblico* (public monopoly holder) purchased the beasts at a fixed price per pound.<sup>8</sup> The route itself was clearly defined by law, and the transit of herds through Venetian territory was monitored closely. Deviations from the route meant the confiscation of the animals and severe pecuniary penalties for the herders and their Imperial employers. Foreign cattle could only travel during daylight hours, and their minders had to corral them each night in specially designated public pastures that the Venetians had established along the route. The Senate intended such measures to prevent the damage that would have occurred to nearby fields and common lands if the herds had been allowed to move freely through the Venetian *terraferma*.<sup>9</sup> Once the animals arrived in Marghera, representatives of the *Provveditori alle Beccarie* (the elected government supervisors of the butcher's guild) and the *Provveditori alla Sanità* (public health officers) inspected the animals. If the cattle received a clean bill of health, the *partitante* was allowed to sell them at auction—although in practice the *partitante* often tried to auction the animals as quickly as possible to avoid the health inspections.<sup>10</sup> Members of Venice's butcher's guild—or *beccaria*—fattened the beasts they purchased in the auctions *in situ*, before ferrying them a few at a time across the lagoon to the slaughterhouses at San Giobbe for processing.<sup>11</sup> But Venetian demand remained insufficient to consume all the cattle in the Marghera pens. Buyers from

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<sup>8</sup> The Venetian *Libbra* or pound was similar to a British Imperial pound of the era. See Angelo Martini, *Manuale di metrologia* 1883; repr. (Rome: E.R.A., 1976).

<sup>9</sup> The system is similar to the pasture management system used for sheep in the Kingdom of Naples and in Spain. See John Marino, *Pastoral Economics in the Kingdom of Naples* (Baltimore: Johns Hopkins University Press, 1988)

<sup>10</sup> The *partitante* was usually accused of skirting the inspections during epizootic outbreaks. The most common complaint was the *partitante* would hear of distant outbreaks before public officials, and react by heavily discounting the cattle rather than informing the authorities.

<sup>11</sup> For more on the slaughterhouse at San Giobbe see Giovanni Caniato and Renatto dalla Venezia eds., *Il macello di San Giobbe* (Venice: Marsilio, 2006).

nearby areas, as well as from other Italian states also participated in the auctions, and were responsible for moving any animals they purchased to their eventual destinations—again using legally defined routes and pastures to take the animals out of Venetian territory.

The quantitative records of the *partitante* and the public authorities who monitored the cattle trade tell us with considerable precision how many animals were butchered in Venice and how many were bought by outsiders and taken elsewhere, but they cannot tell us much about Italian rates of consumption outside of the lagoon. One qualitative indication that Venice was not the only market where consumers were more interested in beef than ever before comes from the petitions addressed to the Venetian Senate for permission to build new slaughterhouses on the mainland. Because meat was a regulated commodity, the Venetian state required regular inspections of all slaughterhouses in its territory. Prior to the eighteenth century, this largely meant monitoring the butcher's guilds in the larger mainland cities and towns. By the middle of the eighteenth century, even relatively small rural communities were successfully petitioning the Venetian authorities for permission to build public slaughterhouses of their own. For example, in 1780 the village of Nera in the territory of Verona petitioned the Venetian Senate "to build a slaughterhouse and public meat market for the convenience of our people."<sup>12</sup> On the same day, the Senate approved plans for a new, far larger, public slaughterhouse in Padua, which was needed "to accommodate the greater number of beasts purchased by the city's butchers."<sup>13</sup> The new structure

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<sup>12</sup> ASV, *Senato Terra*, Filza 2913, c. n.n. (30 March, 1780) con allegati.

<sup>13</sup> ASV, *Senato Terra*, Filza 2913, c. n.n. (30 March, 1780).

included offices for Venetian officials to work in, and separate killing floors for veal, dairy cows, and beef cattle. One petition submitted by a village in the territory of Treviso even claimed that if the Senate were to deny the request, “public disorder will result from the paucity of meat for the public.”<sup>14</sup>

The scale of the early modern cattle trade may come as a surprise. Unlike the trade in grain and sheep, the meat trade has attracted limited attention from scholars. In large measure this is due to two factors: the beef trade does not surface in the documentary record with the same frequency as grain and sheep, and the industries that the cattle trade supplied were not as important as those connected to the sheep trade. This is especially true of the large scale Iberian transhumance system known as the Mesta and its close cousin in the Kingdom of Naples, which enjoy a high profile in the archives and the scholarship, not only because they involved the simultaneous annual movement of tens of thousands of animals from the mountains to the plains and back again, but because of their political and economic importance as the foundations of the woolen textile trade—the engine of the Renaissance economy.<sup>15</sup> For these reasons, Fernand Braudel devoted significant space in *The Mediterranean* to the importance of transhumance, and made not a single mention of the one-way trade in cattle.<sup>16</sup> By contrast, the beef cattle trade supplied the raw material for much more modest industries—butchers, sausage stuffers, leather workers, and candle makers. Yet beef

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<sup>14</sup> ASV, *Provveditori alle Beccarie*, B. 61, c. 156r.

<sup>15</sup> See Marino, *The Pastoral Economy*; Julius Klein, *The Mesta* (Cambridge, Mass.: Harvard University Press, 1920); and Marie-Cluade Gerber, *L'élevage sous les rois catholiques dans le royaume de Castille (1454-1516)* (Madrid: Casa de Velásquez, 1991).

<sup>16</sup> Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II* (Berkeley and Los Angeles: The University of California Press, 1972) 80-110. Braudel mentions cattle a total of eight times, and never in the context of long distance trade.

cattle travelled impressive distances and attracted large amounts of capital. Moreover, while the hides for leather, intestines for sausage casings, and hoofs, horns, and bones for tallow production may not have the cache of Merino wool, the Venetian state still treated them as taxable commodities. Indeed, every intestine extracted during the slaughter at San Giobbe was tagged and accounted for before being given to the city's sausage makers, and every pound of tallow carefully measured and recorded before distribution to the candle makers.<sup>17</sup> Thus the rise of the beef cattle trade in eighteenth-century touched on more than just Italian dietary habits.

If the new, denser connections between Venice and the Hungarian plain provided protein surpluses and ready access to secondary products for urban populations throughout northeastern Italy, they also created the conditions for less benign forms of biotic exchange. Almost as soon as Hungarian cattle started flowing into Venetian territory in the 1680s, local herds along the trade routes began to manifest signs of an unknown respiratory disease. Witnesses reported seeing “beasts with white foam around their nostrils, followed by difficulty breathing and an unwillingness to take food.”<sup>18</sup> More alarmingly, “the affliction moves rapidly from one beast to the next, so that if the sick cattle are not quickly separated from the rest, all will soon die.”<sup>19</sup> For Venetian property owners and peasants alike, the prospect of an uncontrolled bovine plague caused fear. Unlike many parts of northern Europe, where draught horses pulled ploughs and turned millstones, Italians still relied almost exclusively on oxen for

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<sup>17</sup> The state was obviously interested in using the remnants of the carcass to generate tax income, but it also took a share of the tallow to make candles for use by the city's poor during important feast days on the religious and civic calendars.

<sup>18</sup> ASV, *Provveditori alla Sanità*, B. 701, c. 107.

<sup>19</sup> ASV, *Provveditori alla Sanità*, B. 701, c. 107.

agricultural production. Therefore, a widespread bovine epizootic threatened not only meat consumption and dairy production, but the ability to plant and harvest staple cereal crops as well. The worst-case consequences for Venetian farmers and urban residents alike were nothing short of apocalyptic. It is no surprise, therefore, that Venice and other Italian states developed an immediate interest in controlling the spread of epizootic diseases.

### **Reactions to Cattle Plague**

The initial reaction to the increasing frequency and severity of bovine plagues was to extend the authority of existing public health institutions. Venice, like most other Italian states, opted to hand responsibility for controlling epizootic outbreaks to the *provveditori alla sanità*—the magistracy in charge of responding to plague and other human diseases. At first blush this may seem odd, but operating under the Galenic assumption that animal bodies and human bodies are made of the same elements and share many of the same physiological characteristics, the choice becomes clearer. Moreover, the *sanità* possessed centuries of experience with controlling the spread of infectious diseases in the human population. The *sanità*'s records reveal that its officials chose to respond to epizootics in much the same way as they would have to an epidemic. Strict quarantine of both afflicted individuals and communities was the first and most important step. And, as we saw in the case of the 1779 outbreak in Istria, border closings and halting commerce originating in afflicted areas soon followed. The *sanità* also applied the same rules to the disposal of cattle that had died from an epizootic as it did to the cadavers of human victims of plague: the carcasses had to be

buried in a pit no less than eight feet deep and covered with at least six inches of lime before the pit was covered again. The stalls where dead animals had been kept had to be dug out to a depth of several inches and the bottoms of the pits covered by a layer of lime before refilling them with fresh earth. Pastures where afflicted animals had grazed were off limits to healthy animals until the outbreak had passed—usually for a double-quarantine period of 80 days. All these provisions were drawn from the already existing rules for dealing with homes in which infected people had perished. In general, we can observe that the new regulations for animals replicated the old regulations for people down to the smallest detail.

While handing responsibility for animal plagues to institutions with a great deal of experience with epidemic disease made sense, it turned out that these institutions were particularly ill-suited in many ways to respond to epizootic diseases. Plague magistracies operated primarily in urban environments—where epidemics were both more common and more devastating—and were staffed to a large extent by men from those same cities. The doctors in the employ of public health institutions may have had a Galenic outlook when it came to the connections between human and animal bodies, but they usually lacked any real familiarity with the conditions in which domesticated animals in the countryside lived. Moreover, they had no experience at all treating sick animals. Animal health had traditionally been the responsibility of farriers and blacksmiths—men who had no connection at all to even the lowliest of the medical professions.

Ignorance of rural environments and the treatment of live animals hampered the ability of plague magistracies to respond to epizootic diseases in two important ways. First, the same Galenic assumptions that underpinned the conviction that human and animal bodies were similar, also pointed towards what we would now call environmental explanations for epizootic diseases. That is to say, traditional Galenic diagnostic procedures required the physician to look to the qualities of place—air, water, local foodstuffs—first, when searching for the cause of an illness. However, an accurate environmental etiology of bovine plagues required a far greater knowledge with the lifeways (where they liked to go, what they preferred to eat, and so on) of large ruminants and ungulates than any city doctor was likely to possess. Second, because the farriers and blacksmiths who did have empirical experience with sick animals were almost completely disconnected from the medical professions, it proved relatively difficult for medical personnel in the employ of the *sanità* to tap into their expertise. This all explains the perfect correspondence between the rules for epidemics and the rules for epizootics, as well as the initial failure of traditional public health institutions to deal effectively with the new threat represented by bovine plagues. Doctors in the employ of the *sanità* simply lacked enough knowledge of the rural world to adapt existing regulations in any meaningful way.

Although the new diseases were beyond the experience of most physicians at the close of the seventeenth century, those in the employ of public health institutions evinced surprisingly little concern over their lack of concrete knowledge of bovine plagues. Nor, does it appear that they made much of an effort to consult local farriers

when investigating outbreaks in rural areas. The dispatches of public health officials to Venice consistently refer to local farriers and blacksmiths as “rude persons” and “unlettered.” This last accusation may have been ill-founded if the output of early modern Italian printing houses is anything to go by. By the time cattle plagues became a source of concern in the 1680s, farriery manuals were already an established genre in Italy and beyond. Such texts such as Scacco da Tagliacozzo’s L’anatomia del cavallo (1591), Agostino Columbre’s Della natura dei cavalli (1597), and in England Markham Gervase’s Cheape and goode husbandry (1614) enjoyed wide circulation in multiple editions and translations in the seventeenth century. These texts served to formalize certain aspects of the farrier’s art, including the treatment of sick animals. The only problem, from the point of view of public health officials, was that these texts were almost exclusively concerned with equine health. Indeed, the intended audience of these texts seems to have been largely an aristocratic one. All the authors took care to treat the problem of selecting mounts suitable for battle, and to identify those physical traits that were most predictive of a noble character in a horse. These were not the subjects of greatest concern to public health officials facing a barn full of dead cows.

Nevertheless texts such as Tagliacozzo’s ultimately served as the first bridge between the traditional practices of farriery and the world of medicine. By the first two decades of the eighteenth century, abridged versions of treatment regimes taken verbatim from L’anatomia del cavallo and other farriery manuals began to appear in the archives of the *sanità*. The complete versions in the manuals covered more than just recipes for preparing medicinal compounds. Often they included specific



recommendations about the timing of treatment with respect to astrological conditions—a staple of human medicine in the period—as well as advice on such matters as air circulation in stalls and seasonal changes to feed (see figure 1). But public health authorities were mostly interested in the formulation of drugs. Recipes for treating sick cattle that are preserved in the records of the *sanità* include such prescriptions as “scraping the tongue with a solid silver knife” and “having the beast drink a mixture of red wine and herbs through a funnel.”<sup>20</sup> To the extent that such issues as astrological correspondences appear in public health documents, they are always linked to the administration of drugs. So, for example, it was generally understood that respiratory ailments should not be treated when the moon was full or Venus ascendant (the moisture would counteract the effects of the pharmaceutical remedies). The only area in which the *sanità*’s physicians went beyond the prescriptions found in the farriery manuals was in post-mortem examination of bovine cadavers. However, if they hoped opening up dead cattle would reveal the secrets of their demise, they invariably encountered disappointment. Beyond the general observation that “the bowels were yellow and distended,” dissections offered little in the way of concrete advice for an investigating official.<sup>21</sup>

The situation remained static for the first third of the eighteenth century. Bovine plagues flared up somewhere in Venetian territory about every four years, on average. Public health officials and local governors would issue quarantine proclamations, and inspecting physicians would turn up at the site of the outbreak to scold farriers for being

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<sup>20</sup> See for example the recipes contained in ASV, *Provveditori alla Sanità*, B. 701, c. 98.

<sup>21</sup> ASV, *Provveditori alla Sanità*, B. 701, c. 106.

# ILLVSTRI LETTORI.



**V E S T I** segni li quali vedete descritti in ciaschedun membro di questo animale, hauete da sapere, che ogni segno sta, cioè haue la dominatione in quel membro doue il vedete scritto per doi hore & meza, & il pianeta doi ponti & mezo, & il Sole doi giorni & mezo, però quando si stà auuertito di non far cerurgia in quel membro quando alcuni delli sopradetti segni, pianeti, ò Sole, ò Luna hanno il dominio sopra quel membro del sicuro non potrete errare.

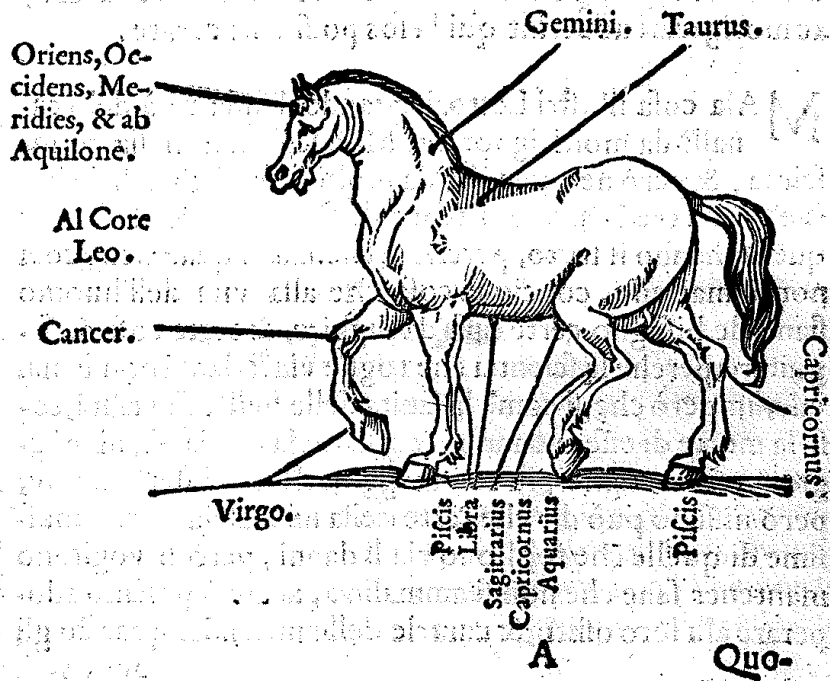


Figure 1. Table of astrological correspondences from Scacco da Tagliacozzo's *L'anatomia del cavallo*.

unlettered while prescribing standard remedies taken from printed farriery manuals. The situation perfectly mirrored the older history of epidemic plagues: a routinized set of responses that, while admittedly imperfect, performed well enough to deal with all but the worst outbreaks. The impetus for changing the status quo would ultimately come from outside the world of public health institutions.

### **Agrarian Reform and Veterinary Medicine**

Eighteenth-century Venice was a peculiar place. Two centuries removed from great power status, the Venetians and their mainland subjects concerned themselves with ambitious projects for internal administrative reform. The bourgeois residents of mainland cities played an increasingly important role in these projects.<sup>22</sup> Mainland elites in subject cities founded academies as venues for enlightened debate and springboards for potential reform. The academies attracted men from the professions—lawyers, doctors, notaries—rather than the traditional aristocratic elites. In smaller rural centers such as Belluno, Udine, and Verona, the academies sought to tackle problems of agrarian reform.<sup>23</sup> The principal goal of the agrarian reformers was to free the Republic from the yoke of food imports through improved cropping and husbandry techniques. In public orations, pamphlets, essay contests, and through the periodical *Giornale D'Italia*, the members of the academies debated the best way for Venice to achieve caloric independence.

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<sup>22</sup> For more on eighteenth-century Venice see Jean Georglin, *Venise au siècle des lumieres* (Paris: Mouton, 1978); Marino Berengo, *La società veneta alla fine del settecento* (Florence: Sansoni, 1956); Alfredo Viggiano, *Lo specchio della repubblica* (Verona: Cierre, 1998).

<sup>23</sup> For the history of the agrarian academies see Michele Simonetto, *I lumi nelle campagne: accademie e agricoltura nella Repubblica di Venezia, 1768-1797* (Treviso: Canova, 2001).

Epizootic diseases did not assume a prominent position in the debates over agrarian reform, at least at first. Crop rotations, seed selection, and the use of mineral-based fertilizers dominated discussions. When agrarian writers tackled the problem of husbandry, they mainly concerned themselves with stocking densities and pasture management. For example, much of the 29 September 1770 issue of the *Giornale D'Italia* was taken up by a debate over the possible application of a technique for expanding fodder production through the use of what the authors referred to as “artificial pasture”, by which they meant rotating animals through fields containing nitrogen fixing crops.<sup>24</sup> The same issue of the journal contained two sentences about an outbreak of rinderpest in the Low Countries that was said to be “so terrible that [the Dutch] are slaughtering all the animals that may have had contact with infected livestock, and burning down their own barns.”<sup>25</sup> The detail about the destruction of valuable buildings was probably noteworthy enough to bring to the attention of the *Giornale*'s readership, but the question of epizootics seemed like an afterthought despite the fact that nearly the entire issue of the periodical had been dedicated to stock keeping practices.

Despite the apparent lack of interest in epizootics in the *Giornale D'Italia*, one segment of the academies' membership was developing a keen interest in animal disease. Physicians such as Jacopo Edoardi, a member of the Accademia degli Anistamici of Belluno, and a prominent doctor in that city, began to write specifically about the question of animal health. Beginning in the early 1760s, Edoardi began to

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<sup>24</sup> *Giornale D'Italia*, 29 Settembre 1770, p. 139 Discorso del sig. Gioseffo Antonio Marangoni della pubblica academia d'Agricoltura di Rovigo sulla necessità di mantenere il più maggior numero possibile d'animali Bovini.

<sup>25</sup> *Ibid.* p. 152.

write letters and short essays on the need to find a new approach to the epizootic problem. In 1777 he circulated a treatise entitled “On the impediments that are encountered in the care of infirm animals, and the little attention paid to their preservation” to members of the academy. The treatise represented the culmination of his thought on the subject. Edoardi pointed to the lack of systematic knowledge about animal diseases, and to the fact that it was useless to debate stocking densities and foddering if one could not keep the livestock already existing in Venetian territory. He argued that a slavish reliance on traditional practices was holding back the art animal medicine. It was “little wonder”, he wrote “that livestock are in such terrible health.” He proceed to argue that:

In the past, for the care of animals and their diseases, the only people employed were those who did not know how to act if not behind mere practice. Whether [such practice] was heard or seen or merely read, they knew nothing more than that of the art of healing. And thus their enterprise was unfruitful more often than not, and instead of healing [the animals], they often accelerated their total loss.<sup>26</sup>

This passage draws our attention to the most interesting feature of the 1777 treatise. Here Edoardi laid the blame for the *sanità*'s poor record with epizootics at the feet of both the farriers and the physicians rather than simply blaming the unlettered, as one might expect. Neither group, he argued, was capable of improving the art, because they relied exclusively on past practices. Whether these were learned during an apprenticeship in the local forge, or by perusing the recipes in Agostino Columbre's book made no difference to Edoardi. Both approaches, he suggested, led to the same pernicious result. The solution, in his view, was to approach epizootic diseases with the

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<sup>26</sup> ASV, *Deputati all'Agricoltura*, B. 22, F. 1, c. n.n. (14 August 1777).

tools of medicine and the new agrarian sciences rather than the tools of the tradesman. For Edoardi the ultimate goal of zootriatics, as he called the new medicine, would be to provide a natural philosophical basis for sweeping agrarian reform.

Edoardi's was not a voice in the wilderness. By the mid-1760s calls for a new "zootriatic medicine" from physicians in the agrarian academies merged with similar rhetoric emanating from within the institutions of the Venetian Republic. The most enthusiastic proponents of zootriatics were the members of the *deputati all'agricoltura* (deputies for agriculture) a new magistracy charged with creating a proper registry for all cultivated land in Venetian territory, and recommending which projects sponsored by the agrarian academies deserved state sponsorship. By the late 1760s, members of the *agricoltura* magistracy had taken up the call to action of Edoardi and other physicians involved in the agrarian academies and were pressuring the public health authorities in the *Sanità* to co-sponsor the establishment of a school for zootriatic medicine at the University of Padua. The notion of a school was not entirely original. A similar institution had been founded in Lyon in 1762 by the French surgeon Claude Bourgelat. So the idea that the solution to epizootic diseases lay in a new science housed in a new institution had already been implemented elsewhere by the time that some Venetians came around to it in the late 1760s.

The *sanità*'s initial response to the proposals emanating from the academies and the *agricoltura* was to suggest sending two students to France to work with Bourgelat.<sup>27</sup>

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<sup>27</sup> In the Fall of 1772 the plan to send two Venetian youths to France was formalized. Two candidates were chosen in May 1773, and arrangements were being made through the Venetian ambassador in Paris. By September the Venetian Senate had reversed course and had agreed to bring Giuseppe Orus to Padua to found a new school. As of now, I have yet to find any account of why everyone changed their

Taking advantage of the existence of the French school seemed more cost-effective than trying to establish a new institution in Padua. What the *sanità* imagined two students might accomplish is unclear, but what is evident is that, at least at first, the public health authorities did not see men trained in the art of zootic medicine as a substitute for regular doctors as the lead responders to epizootic outbreaks. The power of past practice remained strong within the old magistracy. For from unusual, this was the option that all public health authorities throughout Europe pursued. Giuseppe Orus, who would become the first chair of veterinary medicine at Padua, had been sent to study under Bourgelat in 1768 by the Duke of Parma. Other states followed a similar course.

By the Autumn of 1773, the Venetian public health authorities relented in their resistance to the new institute, and Giuseppe Orus signed an agreement with the Venetian Senate to set up the institute in Padua and become the first chair of veterinary medicine at the university (and the first anywhere outside of Bourgelat at Lyons). The new institute was peculiar in a number of ways. To begin with, it occupied an unusual place within the structure of the university of Padua. In agreeing to back the new school, the *sanità* demanded that Orus' institute be awarded a separate endowment and the independence that came with it. That is to say, that the funding for the school and Orus' salary came out of the coffers of the *sanità* and could not be touched by the university's administration. In return for underwriting the costs of the school (which were considerable), the public health authorities had final say over the curriculum and the

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minds, but hope to on my next trip to Venice. The details can be found in ASV, *Riformatori dello Studio di Padova*, B. 443, c. n.n. 8 August 1772, 8 May 1773, and 9 September 1773.

selection of the students, with the ultimate goal of creating a medical school devoted to training professionals who would be bound to the state and specifically to public health.<sup>28</sup> This is not exactly what academy members like Edoardi and the partner institution of the *agricoltura* had originally had in mind. They hoped that the new science of zoiatrics would serve the interests of agrarian reform first and public health second. So from the outset the new school was the fruit of a compromise.

Where Edoardi and the agrarian reformers agreed with the public health authorities was on who should study at the new institution and under what terms. Clearly, even under the most optimistic conditions, a zoiatric doctor would not occupy the same social and scientific status as a regular doctor. The solution was to recruit students from the families of members of the lower-status medical professions. The *Sanità* asked the agrarian academies to nominate (and financially support) possible students for inclusion in Orus' first class. The public health authority also looked outside the boundaries of the state for what we might term fully funded prospects. Indeed, six members of the initial class of 21 were from other Italian states—two Neapolitans, two Modenese, and one Ferrarese—although one of the Modenese students was almost immediately expelled and replaced with a student from Udine.<sup>29</sup> The substitute, the 19-year-old son of an apothecary with the suggestive name of Giacomo Medici, reflected the social and professional origins of the first veterinary students. Some were orphans

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<sup>28</sup> The new school was housed in a deconsecrated convent which had to undergo considerable modifications in order to house a complete anatomy theatre, specialized equipment for hoisting and moving large animals and so forth. The hoists proved particularly challenging and costly to build.

<sup>29</sup> The expelled student, Antonio Amici, was, not coincidentally, the only member of the first class from a socially elevated background (he was a younger son of a member of the Modenese court). He struggled under the strict catholic discipline (mandatory attendance at matins and vespers) imposed by Orus. He violated the curfew several times to go gambling, and was finally expelled after beating one of the servants whom he suspected of being the one reporting on his nighttime activities.



sponsored by elite members of the agrarian academies (although two were orphans sponsored by local clergy). Others, like the young Medici, were children of members of the medical professions—apothecaries and barber surgeons mostly—whose fathers clearly hoped that a university degree would elevate the family fortunes.

While the class origins of the Paduan students presented potential social problems within the walls of the university, they provided the perfect solution to what Edoardi and other agrarian reformers saw as the central weakness of the traditional public health approach to epizootic disease. As Edoardi pointed out in his 1777 treatise, animal health fell into what we might term a professional gap. Farriers lacked the kind of disciplined empiricism necessary to improve on traditional remedies, while physicians lacked the requisite knowledge of agriculture and husbandry for their disciplined empiricism to have any effect. What Edoardi was pointing to, in essence, was the lack of an intermediary group of experts who could mediate between the craft knowledge of the farriers and the more abstract knowledge of university trained physicians—precisely the role played by surgeons and apothecaries in the medical professions. By recruiting the children of those men, Edoardi and his fellow reformers hoped to create a parallel professional structure within zoiatrics, thereby making animal medicine professionally and socially similar to human medicine.

The establishment of the new school as a separately endowed institution under the control of the Venetian public health authorities became the key to achieving the ambitions of the agrarian reformers. In retrospect this separate institutional status served to isolate Orus and his students from the rest of the medical faculty and students

at Padua. In the short term, however, it allowed him the necessary freedom to create his own curriculum and pedagogical methods. Orus, like Edoardi and the agrarian reformers, was convinced that veterinary medicine required both traditional medical learning and a mastery of practical skills. This is evident in the kit that each student received upon enrollment in the school.<sup>30</sup> It included surgical implements, needles for sutures, scalpels and bone saws for the anatomy lessons, cautery and lithotomy equipment—in other words all the standard equipment of the physician. But he also issued them blacksmith's tools and bags of nails for shoeing horses and other manual skills, as well as mortars and pestles for grinding and preparing their own pharmaceuticals—the standard equipment of farriers and apothecaries. An interesting side note is that every student received templates and shears for clipping the ears of dogs, confirming that from the outset Orus wanted his students to treat more than just livestock. Indeed, Orus opened a clinic at the school to give his students practice diagnosing and treating ailments and the variety of animals brought in for treatment was astounding. It included dogs, cats, birds, a mouse and even a camel in addition to the expected cattle and sheep.<sup>31</sup>

There is something admirable about Orus' curriculum, with its emphasis on practical skills, especially in contrast with the hands-off nature of traditional medical training, with the students seated in the anatomy theatre while the professor directed the

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<sup>30</sup> Orus kept meticulous records of his correspondence with the *Sanità*, in part because he feared being accused of misusing the considerable financial resources that had been placed at his disposal. As a consequence, there are several complete inventories of instruments, with detailed justifications for their purchase. The list above comes from one of Orus' first letters outlining the curriculum and its financial costs, and is found in ASV, *Deputati all'Agricoltura*, B. 29, c. n.n. (17 September 1773).

<sup>31</sup> The list of animals treated in the clinic can be found in ASV, *Deputati all'Agricoltura*, B. 29 c. n.n. (26 July 1778).

surgeon's actions and pointed out the salient structures with his pointer. Orus, by contrast provided sufficient animal corpses that each one of his students would have the opportunity to get his hands dirty in the abdominal cavity. It was only when Orus asked for human cadavers, so that "[his] students might learn comparative anatomy" that he was refused. Nevertheless, by throwing his students into the trenches and incisions, Orus provided them, and by extension the Republic, with exactly the kind of professional the agrarian reformers and public health authorities desired. At the same time, Orus' emphasis on practical skills likely prevented them from attaining the same professional status as the graduates of the medical school. This result is clearly evidenced in the reports that the newly trained zootriatic doctors sent back to Venice from the sites of epizootic outbreaks. They are often remarkable displays of medical erudition, especially in terms of the specialized knowledge of the anatomy of the bovine digestive tract, something the *Sanità*'s physicians had never gotten around to understanding. But in the eyes of many, including local governors who often referred to them as *protomedici*—a term used to refer to barber surgeons—they remained something less than an actual physician, although something far greater than a farrier.

The status problem was not lost on Orus, but he was never able to resolve it to his own satisfaction. In 1777 when he gave his public lecture to celebrate the establishment of the new chair of medicine (the lecture was delayed for almost two years because Orus was so often summoned to the sites of epizootic outbreaks) he decided to confront the issue head on.<sup>32</sup> He opened by echoing the rhetoric of Edoardi

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<sup>32</sup> The full text of the lecture is found in ASV, *Deputati all'Agricoltura*, B. 29, c. n.n. 11 March, 1777 (1776 m.v.). All quotes are from that text.

and the agrarian reformers, stating that he was happy that “zooatrics is being rescued from oblivion” but then added a novel twist by saying that “a new age of glory is opening for it to have the noble career in our Italy that it had amongst the Romans and the Greeks.” He then laid out the plan of his lecture which was to define “what the Art is, its antiquity, and the persons who practiced it, and the honors they received from their own nations for doing so,” before proceeding to “the reasons for which from the fourth century until our own day, it had to languish without honor, forgotten and extinct, and its glorious resurgence” in his own day. What Orus attempted to do in his lecture went far beyond what his sponsors among the reformers and public health authorities originally intended. By claiming to be the bearer of a forgotten classical tradition, he simultaneously elevated comparative anatomy to the same level as human medicine and erased its association with rural trades such as farriery—which he pointed to as a completely separate and unrelated tradition. In other words, Orus argued that Edoardi and the reformers had gotten it wrong. The purpose of zooiatric medicine was not to correct the errors of farriery. Rather, it was to resuscitate a branch of medicine that had fallen into disuse. Throughout his lecture he pointed out that the most important medical writers of antiquity, including Galen and the Hippocratic writers, especially the Alexandrian writers, “did not disdain to discuss the ailments of brute animals.” He even managed to insert the Persian writer Al Rhazes into zooiatrics’ illustrious new genealogy.

Orus certainly had a point. Many classical medical authorities were interested in animal anatomy. And it was traditional Galenic ideas about the similarity of human and

animal anatomies that had led to Italian states to make public health authorities responsible for epizootic outbreaks in the first place. One might even add that those Galenic ideas underpinned the way that public health authorities had chosen to approach the new epizootic diseases. However, there was also a strong element of invented tradition in the lecture. Momentarily, at least, the maneuver was effective, and several witnesses reported that Orus received a loud and long ovation from the standing-room only crowd composed of the assembled medical faculty and scores of curious Paduans.<sup>33</sup>

And yet, like the curriculum, the decision to link zoiatrics so strongly to a classical past had unexpected consequences. For one thing it meant that the glories of Renaissance medicine—including but not limited to Vesalius—were eliminated from Orus’ genealogy of medical knowledge.<sup>34</sup> Indeed, this new form of medical knowledge represented a powerful resurgence of Galenic authority within the university. Indeed if the paper trail left by Orus’ students at the sites of epizootic outbreaks represented a new kind of medical erudition, it was a peculiar one. In his own textbook, which he never published and survives only in manuscript form, Orus advocated a diagnostic strategy that came straight out of the ancient Hippocratic corpus. To put it simply, he viewed the causes and etiology epizootic diseases almost exclusively in terms of “airs, waters, and places”, the traditional explanatory arsenal of ancient medicine.

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<sup>33</sup> Ibid. The letters from witnesses are appended to the text of the lecture.

<sup>34</sup> Possibly as serious as the elision of Vesalius was the elimination of Fracastoro, whose theory of particulate transmission of disease was popular in the Paduan medical school at the time, and might have provided an explanatory framework for the cursed pasture problem.

To see Orus' methods at work, let us return now to the December 1779 Istrian outbreak we started with. In February of 1780, Orus travelled to Istria to evaluate the outbreak in person.<sup>35</sup> In his own reports, Orus used a new term to describe what the Istrians were facing. Instead of the more common term *polmonara*, he identified the respiratory disease as *pleuropneumonia*. His diagnosis was based both on an observation of the symptoms—coughing, foaming at the nostrils, and an excess of phlegm—and several post mortem dissections he performed in which the congestion of the lungs and heart was described in great detail. The learned professor then pointed to a common set of interrelated causes for the disease: filthy stalls and infected pastures (places) sharing troughs with sick animals (waters) and moving too quickly from the cold to the heat and back again (airs) all of this caused a “noxious fluctuation of the humors.” He recommended a combination of dietary changes (a staple of Hippocratic and Galenic medicine) and environmental controls as the course of treatment. Orus also spent two pages condemning “the common practice of farriers and blacksmiths who are accustomed to bleeding the beasts, which only serves to exacerbate the humoral imbalance and makes the disease worse.” Once again Orus wanted most of all to distance his discipline from the rural trades and place it squarely within an official genealogy of medical ideas.

## **Conclusion**

Even as Orus soaked in the applause that followed his lecture, he had set veterinary medicine at Padua on a difficult path. His justification for veterinary medicine as a scientific discipline was ultimately out of step with what his colleagues in human

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<sup>35</sup> ASV, *Provveditori alla Sanità*, B. 712, c.c. 8-10 and passim.

medicine were doing. The Renaissance medical revolution, which had taken place at Padua, along with the apparent triumph of mechanistic views of medicine and the body, had not completely dispensed with Galen. Classical authorities remained important. But more recent authorities, from Vesalius to Fracastoro, and Malpighi tended to stress both their connection to and their improvement on the classical legacy. Orus, on the other hand, evinced ambivalence, at best towards the achievements of the Renaissance in his history of medical thought. Other veterinary writers, including the Frenchman Bourgelat, who had trained Orus, and the Italian Benvenuti were even more critical of the Renaissance—the latter calling it a period of “absolute darkness.” Perhaps one might say that in swearing his allegiance to everyone from the Hippocratics to Al Rhazes, Orus demonstrated that *he* belonged on the medical faculty at Padua, but simultaneously failed to bring his discipline along with him. More critically, he ultimately undercut the support his institution enjoyed from both the Venetian state and the agrarian academies. And when Orus died suddenly in 1792—he was only 44—the *riformatori dello studio di Padova*, the administrators of the University, successfully petitioned the Senate to take control of the veterinary school away from the *sanità* in order to fully integrate the school into the university. Their first act upon seizing control of the school was to downgrade the curriculum from an intensive four-year program that combined formal medical training with practical skills to a two year program “that more befits a purely practical discipline such as veterinary.”

The legacy of Orus’ school, then was mixed. He failed to help veterinary medicine to achieve the status of a true medical discipline in the eighteenth-century

Italian university. He also invented a professional identity for himself and his students that was at odds with what his backers in the *sanità* and the agrarian academies wanted, which was a slightly lower status profession that would fill a professional gap. But they had also wanted to change the way that public health institutions responded to epizootic emergencies, and in this respect the invention of veterinary medicine can be understood as a resounding success. Orus and his students emphasized diagnostic procedures that focused on the particularities of each outbreak. Rather than a routinized response, Orus' actions during the 1779 outbreak in Istria showed a careful attention to the specificities of the case—how had barns been maintained, what pastures appeared to host the infection, what were the locations in which infected animals came into contact with healthy ones, in what way were water sources connected, and so on. This neo-Galenic airs, waters, places approach dispensed with what Edoardi had identified as the reliance on fossilized recipes and practices. Ultimately, it also became the way that public health institutions solved some of the pressing urban problems of the nineteenth century.