FORUM: ANIMALS IN MODERN U.S. HISTORY

Remembering and Forgetting the Great Horse Flu of 1872–1873

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Starting in late September 1872, horses started falling ill with a severe respiratory complaint in the countryside about a dozen miles north of Toronto, Ontario. Veterinary experts swiftly diagnosed the malady, which paralyzed street transportation, commerce, and everyday life in Toronto itself during the first weeks of October, as influenza. Over the next year, an equine plague that most contemporaries referred to as the epizootic—and which I call the Great Horse Flu in the book I am completing on this outbreak—spread throughout southern Canada, every reach of the United States, and parts of Cuba, Mexico, and Central America. The novel influenza virus responsible for this outbreak sickened between ninety and ninety-nine percent of horses, donkeys, and mules across this vast swath of the northern Americas.¹ Our best guess is that the Great Horse Flu killed between one and four percent of the equines it afflicted—a case fatality rate roughly not unlike those recorded by the Great Influenza Pandemic of 1918–1920 and the COVID Pandemic. In less than a year, an estimated 112,500 to 554,000 horses and ponies perished alongside tens or hundreds of thousands of mules and donkeys.²

Everywhere the epizootic struck, human societies remained heavily dependent on equines, especially for motive power. Because of this reliance, the epizootic sowed economic paralysis while disrupting everyday life. The same virus also seems to have spilled over to infect poultry, hogs, and possibly other creatures, too, causing localized outbreaks that decimated chicken coops in the Hudson Valley and other areas while causing dozens or hundreds of human fatalities in communities scattered across the continent.³

In late 1872, as New Orleanians' tussle with the Great Horse Flu was finally abating, the *Times-Picayune* lamented that the Crescent City continued to labor under "a considerable deficiency." More than a month after the largest, most disruptive outbreak of equine influenza in

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¹James Law, "Influenza in Horses," in U.S. Commissioner of Agriculture, *Report of the Commissioner of Agriculture for 1872* (Washington, DC, 1873), 209.

²These figures draw on ibid., as well as a wealth of other accounts. Nancy K. Bristow places the mortality rate during the Great Flu Pandemic at 2.5%. Nancy K. Bristow, *The American Pandemic: The Lost Worlds of the 1918 Influenza Epidemic* (New York, 2012), 3.

³On poultry, see David M. Morens and Jeffery K. Taubenberger, "Historical Thoughts on Influenza Viral Ecosystems, Or Behold a Pale Horse, Dead Dogs, Failing Fowl, and Sick Swine," *Influenza and Other Respiratory Viruses* 4 (2010), 334 and David M. Morens and Jeffery K. Taubenberger, "An Avian Outbreak Associated with Panzootic Equine Influenza in 1872: An Early Example of Highly Pathogenic Avian Influenza?," *Influenza and Other Respiratory Viruses* 4 (2010), 375. Hundreds of sources document human cases; see, e.g., "Facts and Fancies," *Richwood* (OH) *Gazette*, Dec. 26, 1872 and "Neighborhood News," *Cairo* (IL) *Bulletin*, Jan. 22, 1873.

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North American history reached the Lower Mississippi Valley, the *Times-Picayune* predicted that the epizootic would "soon be remembered only as a strange and unaccountable visitation, which for the time being had its sway and worked out its mission of disease and death."⁴

As this journalist foresaw, the passage of time would indeed go on to dim and distort recollections of the epizootic. Surprisingly, though, this outbreak proved harder to forget than anyone anticipated. Five years after COVID-19 first erupted, we are all intimately familiar with the complexities and contradictions of pandemic memory. This essay uses newspapers and other sources to analyze the patterns of remembering and forgetting that took shape in the aftermath of a very different outbreak.

The Great Horse Flu of 1872-1873 undoubtedly ranked as one of the most peculiar disease events in modern American history. This fact alone, however, hardly guaranteed it a place in human recollections.⁵ The so-called Spanish Flu, after all, which killed some 675,000 Americans between 1918 and 1920, sickened tens of millions of others, exacerbated the travails of World War I, and troubled the "return to normalcy" that followed the Allied Powers' victory—soon became a "forgotten pandemic," vanishing from public memory even as millions mourned their losses.⁶ Unlike the "public amnesia about the pandemic" that historian of medicine Nancy K. Bristow so compellingly elucidates, the Great Horse Flu remained an active component in American memory until an unexpected concatenation of historical transformations finally combined to displace it. Historians have long grasped the far-reaching significance of one of these transformations—the decline of equines as prime movers in North American economies. Scholars have proven less attentive, by contrast, to two epidemiological developments: first, a growing rejection of a centuries-old truism casting human influenza and equine influenza as similar or identical disorders stemming from a common cause, and second, an epochal shift from horses to hogs and poultry as the key intermediaries through which novel influenza variants passed from wild avian reservoirs to human hosts.

How and why did the Great Horse Flu maintain so firm a hold over public memory in the decades following the outbreak? What purposes did these epizootic recollections serve? And how did landmark shifts in the complex entanglements between viruses, humans, and myriad domesticated creatures eventually combine to unseat this peculiar equine scourge's hold on human memory?

Even after the epizootic petered out in late 1873, the outbreak's scale, duration, and inscrutability continued to lend it enduring purchase. French-born, New-York-based veterinary surgeon Alexandre Liautard took it as a given in 1881 that "everyone remembers the epizootic of 1872."⁷ Nearly twenty years later, a Pennsylvania newspaper echoed this assertion. "It isn't so long ago," the *Wilkes-Barre Sunday Leader* asserted in 1897, "that the average man of thirty cannot remember the 'epizootic.' It tackled man and brute alike," the paper noted, "and wasn't particularly averse to encircling the neck of an old hen, as hundreds of fine fowl died from its effects."⁸

^{4&}quot;The City," New Orleans Times-Picayune, Dec. 27, 1872.

⁵There seems to be no real way to gauge whether the equines this scourge afflicted remembered it in any meaningful way. It is worth noting, however, that researchers now use the term "memory" to refer to "the ability of the immune system to respond more rapidly and effectively to pathogens that have been encountered previously." Charles A. Janeway, Jr., Paul Travers, Mark Walport, and Mark J. Shlomchik, *Immunobiology*, 5th ed. (New York, 2001), ch. 10.

⁶Alfred W. Crosby, *America's Forgotten Pandemic: The Influenza of 1918*, 2nd ed. (New York, 2003); Bristow, *American Pandemic*, introduction. As Bristow explains, "the pandemic was not forgotten, but rather lived on in individual and family memories and in countless lives remade by personal trauma and family loss." Ibid., 7–8.

⁷A. Liautard, "Influenza, or 'Pink-Eye' in Horses," *American Agriculturist*, n.d., in *Lane* (KS) *Advance*, Dec. 23, 1881.

⁸"The Same Diseases but Different Names," *Wilkes-Barre Sunday Leader*, Jan. 3, 1897. See also *Wilmington* (DE) *Republican*, Aug. 17, 1901.

Into the early 1900s, older folks continued to regale newspaper readers with stories about the Great Horse Flu's ravages. When a transit strike paralyzed electric railways in 1900, for instance, the *St. Louis Globe-Democrat* published an interview in which "Uncle" Dan Larkin reflected on the paralysis Missouri's largest city had suffered "way back in '71 [sic], when the epizootic laid up the horses and mules."⁹ In 1907, Indianapolis's "oldest inhabitant" told the *Star* about the time the epizootic "seized upon the horses of Indianapolis and other cities and the affairs of the city were wholly at rest for a period of almost a month. . . . Like the sun and the moon which stood still at the command of Joshua in days B.C.," this elder Indianapolitan continued, "business, church affairs, politics, society and almost every branch of industry that makes the city's life teem with activity remained transfixed while veterinarians battled with the plague that threatened to keep the city practically dead for months, winning in the end only a partial victory on account of the deaths of hundreds of the city's most valued animals."¹⁰

Recurrent outbreaks of equine influenza help explain why Americans continued to remember the Great Horse Flu. With the malady retracing its old route from the Atlantic Seaboard to Pittsburgh in 1875, for instance, the *Dispatch* reassured readers that "nothing as serious as 1872 is anticipated."¹¹ As cases of equine influenza spiked upwards once again in 1880, the *Hartford Courant* observed that even though "the distemper at present prevailing among horses in this section has many features in common with the great epizootic of 1872," the new outbreak had "thus far ... show[n] no such severity."¹²

Equine influenza kept epizootic memories relevant. Yet a pair of postulates—that influenza among humans and equines stemmed from the same underlying cause, and that the malady could be communicated from the one to the other—also supported recollections of the Great Horse Flu. This became especially evident during the so-called Russian Flu of 1889–1892, a multi-wave outbreak first reported in the eastern reaches of the Tsar's domains (and, according to some recent research, perhaps the result of a coronavirus rather than influenza).¹³ When Boston's city physician investigated a sudden eruption of respiratory illness at one municipal institution in December 1889, for instance, he remarked: "Their symptoms vividly recalled those which marked the horses when the epizootic raged so extensively here in 1872."¹⁴ This healer was hardly alone in equating human influenza with equine influenza. Consider, for instance, how Mexico City's *Two Republics* fretted that the Great Horse Flu's past foretold the Russian Flu's prologue. "Do I think it will come here?" it asked near the end of 1889, then answered: "Why not? The epizootic did, and that was nothing more than a 'horse influenza."¹⁵

Memories of the epizootic also remained current because the American economy continued into the twentieth century to depend heavily on equine exertions. An 1895 article in the *Knoxville Journal and Tribune* confidently envisaged that "in a decade every man can become his own charioteer and the days of trouble caused by lame horses and epizootic will have become

⁹St. Louis Globe-Democrat, n.d., in "Worse Than the Strike," Brooklyn Eagle, Aug. 25, 1900.

¹⁰"Epizootics Halted Business in 1872," *Indianapolis Star*, May 19, 1907. See also "Why Worry Over Strike, Says Old Timer," *St. Louis Post-Dispatch*, Aug. 15, 1907.

¹¹Pittsburgh Dispatch, n.d., in "The Epizooty," St. Louis Globe-Democrat, Oct. 9, 1875.

¹²"The Horse Disease," *Hartford Courant*, October 4, 1880. The view that influenza had "recurred each spring to a more or less extent," as one Buffalo veterinary surgeon put it, also lent continuing relevance to the Great Horse Flu; Dr. Hutchins quoted in "Grip Among Horses," *Buffalo Courier*, Apr. 8, 1891.

¹³For discussions, see Patrick Berche, "The Enigma of the 1889 Russian Flu Pandemic: A Coronavirus?," *La Presse Médicale* 51 (2022), 104111; and Derek Gatherer, "Some Believe the 1889 Russian Flu Pandemic Was Actually Caused by a Coronavirus—Here's Why That's Unlikely," *The Conversation*, Jan. 9, 2024.

¹⁴"The Disease at Boston," *Cincinnati Enquirer*, Dec. 19, 1889. See also *Lafayette* (LA) *Advertiser*, Dec. 21, 1889 and "Epidemic Influenza," *Philadelphia Times*, Dec. 29, 1889. For evidence that equines also suffered flu-like outbreaks around the same time, see "Sickness among Horses," *Helena* (MT) *Independent-Record*, July 13, 1889; "The Epizootic Again," *Atlanta Constitution*, May 1, 1891.

¹⁵"Be Ready to Sneeze," *Two Republics* (Mexico City), Dec. 28, 1889. See also "Doctors Talk of It," *Cheyenne Leader*, Jan. 5, 1890.

a thing of the past.^{*16} And yet even six years later, this brave new world had yet to materialize. "Many people will remember the epizootic of 1874 [sic]," declared a *Boston Globe* report on a 1901 "horse epidemic" in metropolitan New York that one veterinarian described as "the most serious outbreak of disease among horses" since the Great Horse Flu.¹⁷ "What changes," this article marveled, "have come to the horse since then!" After acknowledging that "rapid transit has dispensed with him a measure since electricity came so generally to the front," it reminded readers that "neither the trolley nor the automobile has yet succeeded in displacing the horse."¹⁸ A week later, a rival paper parroted this moral: "When the horse gives out," the *Evening Transcript* affirmed, "it is demonstrated that we are still a long way from dispensing with his services. In fact, so much has business increased . . . that the lack of horseflesh seems to have as paralyzing an influence upon business as it ever did."¹⁹

The Great Flu Pandemic, like the Russian Flu and recurrent equine influenza before it, brought memories of the Great Horse Flu back to the fore. "The present epidemic of Spanish influenza," a *Hartford Courant* reporter noted in October 1918, during the human outbreak's second wave, "calls to the minds of many of the older generation a severe plague among horses in the early '70s ... popularly known as 'epizootic." "Horses died everywhere," the same writer continued, "in stables and often in the streets, and there were no known cures for the disease." This journalist recalled the epizootic to highlight similarities between the equine outbreak of the early 1870s and "the present human epidemic." As eyewitnesses had attested through the Great Horse Flu's reign, "death occurred after a secondary infection which bore the same relation to the first infection that pneumonia bears to influenza proper in the present plague."²⁰

As the pandemic's second wave loosened its stranglehold over the United States in late 1918, recollections of the 1872–1873 outbreak spurred "health authorities" to advise continued vigilance. "The fact is being recalled," one wire-service item remarked, "that when the 'epizootic' made its appearance it seemed to have run its course, but a recurrence was even worse than when the disease first appeared."²¹ A few days later, the *Cincinnati Enquirer* reported that U.S. Department of Agriculture (USDA) experts were "apprehensive" that "horse influenza or epizootic" might soon break out. "Nearly every war of modern times," these authorities in animal health pointed out, had caused "a disease manifestation among the world's horses." Although "influenza among horses" was supposedly "under better control in all parts of the country" than had been the case in preceding years, the same report nonetheless warned that "unlike certain other infectious diseases, one attack of influenza does not grant a lasting immunity."²² Incessant viral evolution, we now understand, meant that the pathogens responsible for both the Great Horse Flu and the Great Pandemic ceaselessly generated new variants, some of which differed so significantly from their progenitors that they could easily infect hosts who had already survived one or more bouts with influenza.

¹⁶"Automatic Carriages," Knoxville Journal and Tribune, July 10, 1895.

¹⁷F.J. McCafferty quoted in "New Horse Disease," *Independence* (KS) *Daily*, July 18, 1901.

¹⁸"A Horse Epidemic," Boston Globe, June 25, 1901.

¹⁹"The Equine Plague," *Boston Evening Transcript*, July 1, 1901. On this theme of enduring dependence, see also "To Consider Next Year," *Buffalo Commercial*, Dec. 27, 1905.

²⁰"Horse Influenza' Crippled Street Cars," *Hartford Courant*, October 8, 1918. Interestingly, the *Courant* recalled that "gangs of colored men were pressed into service to draw the cars through the streets of New York"—a contingency that seems plausible and even likely, but one that reporting from 1872 never singled out.

²¹Although it is not entirely clear, this article seems to be referring to the epizootic's behavior among human hosts. "Must be Avoided," *Greenfield* (IN) *Reporter*, Nov. 19, 1918.

²²"Turf and Diamond," *Cincinnati Enquirer*, Nov. 24, 1918. This observation probably reflected two distinct dynamics: first, the expanded use of "influenza" in the late 1800s and early 1900s to encompass maladies that were almost certainly *not* traceable to the influenza virus (see below), and second, the continuing role of viral evolution, which continually produced new variants against which host immune systems had only limited immunity.

Yet even as the Great Pandemic rekindled epizootic memories, it was also nudging researchers toward a new forgetfulness regarding a pair of intertwined assumptions that had stood fast since the Great Horse Flu convulsed the continent nearly half a century earlier: 1) that equine and human influenza were similar or even identical entities, and 2) that flu readily circulated between human and equine hosts. Another version of the same USDA warning just quoted took direct aim at the first of these assumptions: "The serious epidemic of influenza affecting the human family," it asserted, "has no relation to the disease of the same name which affects horses."²³ Major George A. Soper of the U.S. Army's Sanitary Corps explained why a growing number of authorities were questioning old beliefs in the likeness of equine and human influenza. "Descriptions of influenza in horses and some of the circumstances under which it is transmitted," Soper explained in a 1919 article in the New York Medical Journal, "so closely resemble what is known of influenza in man as to suggest that the two diseases are identical." But this popular wisdom, Soper contended, could no longer stand up to scientific scrutiny: "That they are not identical, and that neither may be transmitted to the other, are facts which have long been believed by epidemiologists and are now confirmed."²⁴ A Tennessee newspaper put a simpler spin on this emerging viewpoint: "Horses have influenza, too; but it is of a different sort from that which people have."25

Why did medical, veterinary, and scientific experts come to see an impassable divide between human and equine influenza? Several factors led early-twentieth-century Americans to draw new distinctions between diseases their forebears had assumed to be identical or at least closely related. First, veterinarians and other equine healers no longer diagnosed "influenza" as precisely as they had in the late 1800s. By the early twentieth century, they applied the term not only to "shipping fever" (so named because it tended to infect horses in holding and transportation facilities), but also to several other distinct syndromes that also produced flu-like symptoms. As Soper argued, "by some, influenza ["in the horse"] is not believed to be a single disease, but a group of diseases." Veterinarians would later equate shipping fever with bacterial pleuropneumonia; they also discovered that several types of equine herpesvirus could cause fever, coughing, nasal discharge, and other common symptoms long associated with equine influenza.²⁶

A second development—the failure of repeated experiments to communicate the Great Flu Pandemic to other-than-human animals (including equines) by inoculating them with biological material taken from human victims—heaped additional doubt on hallowed notions casting human and equine influenza as twins, or at least as close cousins. A 1919 *New York Tribune* article told how scientists had "found it impossible to transfer the complaint" responsible for sickening hundreds of millions of humans "to any of a long list of animals; monkeys alone showed a toxic effect," the *Tribune* maintained, "but true influenza did not develop." It is difficult to reconstruct why researchers proved unable to sicken laboratory animals by exposing them to the virus responsible for the Great Pandemic (conclusively

²³"Horse 'Flu' Resembles Human Ailment," *Glasgow* (MT) *Courier*, Nov. 22, 1918.

²⁴"George A. Soper, "Influenza in Horses and in Man," *New York Medical Journal* 109 (Apr. 26, 1919), 720.

²⁵"Live Farm Works for Tennesseeans," *The Parisian* (Paris, TN), Dec. 6, 1918.

²⁶Soper, "Influenza in Horses and in Man," 720; J.W. Rainey, "The Army Veterinary Service," *Journal of the U.S. Calvary Association* 28 (Apr. 1, 1918), 475; C.E. Gapen, "When Dobbin Gets the 'Flu," *Country Gentleman* 5 (Dec. 21, 1918), 5; Yousuke Maeda and Masa-aki Oikawa, "Patterns of Rectal Temperature and Shipping Fever Incidence in Horses Transported Over Long-Distances [sic]," *Frontiers in Veterinary Science* 6 (Feb. 2019), article 27; Kara M. Lascola, "Overview of Respiratory Diseases of Horses," rev. July 2023, in *Merck Veterinary Manual*, online at: https://www.merckvetmanual.com/respiratory-system/respiratory-diseases-of-horses/overview-of-respiratory-di seases-of-horses (accessed Aug. 12, 2024). Horses also suffer from asthma and allergies.

identified in the late 1990s as an H1N1 variant). In any case, though, these findings served to undermine centuries-old perceptions of influenza as a species-jumping scourge.²⁷

The growing sense of a fundamental disconnect between human and equine influenza, however, also drew momentum from sweeping changes in influenza's disease ecology. Virologists speculate that at some point in the early 1900s, swine and domesticated poultry began replacing equines as the main "mixing vessels" for influenza. Although this oft-used metaphor threatens to obfuscate more than it reveals, it nonetheless captures the crucial role that other-than-human animals play in influenza's evolution and epidemiology. Wild waterbirds have always served as the primary natural reservoir of genomically diverse influenza A variants. Avian strains, however, almost never strike human populations directly. Instead, they ordinarily reach human hosts only after hybridizing with human-adapted strains deep within the cells of domesticated animals through a process known as viral reassortment.²⁸

We know very little about how, when, and why poultry and swine displaced equines as the key mixing vessels through which novel flu strains reached human populations. All available evidence, though, indicates that this process reached its culmination in the years leading up to the Great Pandemic. The most likely driver of this epochal change was the eclipse of equines in the transportation sector by the internal combustion engine. A pair of leading evolutionary biologists, Martha Nelson and Michael Worobey, explain that "after centuries of influenza epizootics in equines, the 20th century marked a rapid decline in use of horses for urban transport and farm work."²⁹ As horses and their kin receded ever farther from the center of economic life, especially in urban areas, contact between humans and equines grew less intimate as well as less frequent. As a result, the circulation of flu viruses between humans and equines apparently slowed or stopped.

Nelson and Worobey summarized the implications of this evidence in a 2018 article in the *American Journal of Epidemiology*. "In addition to representing one of the greatest disease events in human history," they argued, "the Spanish flu pandemic may also mark a turning point in the ecology of influenza and the increasing importance of swine as reservoir hosts, a trend that accelerated during the second half of the 20th century." Researchers suspect that the H1N1 variant responsible for killing millions of humans, which had "avian origins," first spread to hogs in Iowa in 1919.³⁰ From that time to the present, highly pathogenic avian flu variants have reached human populations chiefly via pigs or domesticated birds. To cite an especially notable example, H1N1 virions leapt from hogs to humans in Mexico in early 2009, triggering an outbreak that eventually killed nearly 300,000 people worldwide.³¹

By the time the pathogen responsible for causing influenza among humans was finally isolated beneath an electron microscope in the 1930s, it "was believed," as one historian of disease has noted, "to be almost exclusively a human virus." This doctrine held fast until the 1950s, when "closely related viruses were discovered" to be responsible for causing influenza in

²⁷New York Tribune, n.d., in "Epizootic and Influenza," *Spokane Spokesman-Review*, Jan. 23, 1919 (also reprinted in "Animals Immune from Influenza," *Victoria* (BC) *Colonist*, May 2, 1919). On efforts to infect primates during the Great Pandemic, see Anita Guerrini, *Experimenting with Humans and Animals: From Aristotle to CRISPR*, 2nd ed. (Baltimore, 2022), 145.

²⁸For an excellent overview, see David L. Suarez, "Influenza A Virus," *Animal Influenza*, 2nd ed., ed. David E. Swayne (Ames, IA, 2017), 3–30.

²⁹Martha I. Nelson and Michael Worobey, "Origins of the 1918 Pandemic: Revisiting the Swine 'Mixing Vessel' Hypothesis," *American Journal of Epidemiology* 12 (2018), 2501.

³⁰Nelson and Worobey, "Origins of the 1918 Pandemic," 2501. Note that the hypothesis of other-than-human animals as "mixing vessels" remains controversial; Suarez, "Influenza A Virus," 7.

³¹The H1N1 Influenza Pandemic of 2009, ed. Charles R. Bartolotti (New York, 2010); F. Dawood et al., "Estimated Global Mortality Associated with the First 12 Months of 2009 Pandemic Influenza A H1N1 Virus Circulation: A Modelling Study," *The Lancet Infection* 12 (2012), 687–695, doi: 10.5281/zenodo.1260250; Theresa MacPhail, *The Viral Network: A Pathography of the H1N1 Influenza Pandemic* (Ithaca, 2014).

"horses, pigs, and birds."³² Virtually every person alive during the Great Horse Flu had perished by the time these discoveries confirmed the discarded nineteenth-century assumption that influenza among humans and equines resulted from the same agent.

The story of epizootic memory holds important lessons as we look back on the Great Horse Flu from a world rent asunder by another species-jumping scourge. Patterns of remembering and forgetting the Great Horse Flu seemed to hinge less on politics and culture and more on shifting economic, ecological, and epidemiological perceptions and realities. Persistent outbreaks of equine influenza kept the epizootic of 1872–1873 relevant for several decades. As horses and their cousins receded from everyday life in the early twentieth century, however, their time-honored role as mixing vessels for viral variation faltered. This biological shift reinforced a new—and, as scientists later discovered, erroneous—conception of human influenza and equine influenza as distinct entities.

After a long hiatus from public memory, skyrocketing gasoline prices led *Baltimore Sun* reporter George A. Gipe to reprise the Great Horse Flu in a 1974 *Sunday Sun Magazine* article entitled "The First Energy Crisis: When Horses Failed."³³ Perhaps the most compelling reason to recall the epizootic today, however, has less to do with energy and technology and more to do with epidemiology. Although flu variants no longer circulate between horses and humans with much gusto, the outbreak of 1872–1873 nonetheless serves as a trenchant reminder of influenza's prowess. Despite widespread descriptions of COVID as a "super flu," the epizootic, like the Great Flu Pandemic of 1918–1920, proved just as deadly and even more infectious.

³²W.I. Beveridge, "Unravelling the Ecology of Influenza A Virus," *History and Philosophy of the Life Sciences* 15 (1993), 23–24.

³³George A. Gipe, "The First Energy Crisis: When Horses Failed," *Baltimore Sun Sunday Magazine*, Feb. 3, 1974.