

# GHI RESEARCH

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## HOW PARASITES MAKE HISTORY: ON PORK AND PEOPLE IN NINETEENTH-CENTURY GERMANY AND THE UNITED STATES

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In early November 1865, a mysterious illness spread in Hedersleben, a village between Halle and Magdeburg about two hundred kilometers southwest of Berlin. An increasing number of the two thousand villagers began to complain about agonizing abdominal cramps, nausea, and severe restlessness. Many of them were overcome by violent bouts of vomiting and diarrhea accompanied by high fever, sleeplessness, and rheumatic muscle pains. By December 1, fifty were dead; just eight days later the death toll had risen to sixty-five. As the Prussian daily *Volkszeitung* reported on December 8, 1865, “the situation in Hedersleben is getting more hopeless every day. Last week a couple of patients had gotten better so that they could leave their room, but then they fell ill again and suddenly died of a paralysis of the lungs.”<sup>1</sup>

Doctors from many German-speaking cities including Berlin, Breslau, Prague, and Vienna traveled to Hedersleben to investigate the situation. Puzzled as to the causes of this ailment, they suspected typhus and even cholera. However, autopsies soon pointed to a very different explanation, especially since a local butcher and his wife had been among the first to die. Their dissected corpses revealed that neither typhus nor cholera had caused their death, but rather a tiny roundworm known as *Trichinella spiralis*. Numerous other autopsies and microscopic investigations of muscle tissue confirmed that thousands of these tiny parasites were the true culprits behind this deadly tragedy in Hedersleben. Having identified the trichinae, medical officials quickly deduced that this epidemic had not been caused by polluted water or contaminated air, but rather by pork.

Within days, the origin of this epidemic was traced to a two-year-old pig. The animal had appeared completely healthy when butcher Becker had slaughtered it on the morning of October 25. News that the local butcher had slaughtered a fat pig had spread quickly, and by that eve-

ning, much of the pig's meat, which had been mixed in with that of three other pigs, was being served on local dinner tables. As was customary in the region, especially among the poor, most pork was eaten raw or barely cooked.<sup>2</sup> No one had suspected that, along with their meat, they had ingested thousands of tiny trichina worms. However, within a week, symptoms of the debilitating illness had begun to appear. By the end of December, more than three hundred villagers had gotten sick and close to one hundred had died. Declaring that: "not even the bullets of war can create such a dreadful scene," the *Volkszeitung* observed that:

There is hardly a more pitiful condition. Tortured by severe pain, these poor people lie fully conscious but unable to move. They complain of shortness of breath because the breathing muscles refuse their duty and hurt badly. Even in the best cases, a new enemy appears, a torturous hunger, but the chewing and swallowing muscles are paralyzed so that only liquid food in droplet amounts can be eaten with great pain.<sup>3</sup>

According to the medical investigations, patients who had vomited often or had strong diarrhea had a better chance for recovery than those who did not. Hence the decision of the local doctor, who (thinking that these were cases of cholera) had prescribed opium instead of the much-needed laxatives, had only increased mortality.

The outbreak in Hedersleben was not an isolated incident. Two years earlier in 1863, there had been a much-publicized case in Hettstädt, a small community in Saxony, where 156 had fallen ill and 26 had died.<sup>4</sup> A number of smaller outbreaks had also been reported from Magdeburg, Quedlingburg, Leipzig, Weimar, Celle, Hannover, Konitz, and even as far away as Malmö, Sweden.<sup>5</sup> The growing recognition of and increased reporting about trichinosis had raised the public's awareness about the potential dangers emanating from meat. It had also sparked widespread scientific interest. That spoiled meat could make people sick certainly was not a new discovery; however, the realization that seemingly healthy animals could pass on deadly parasites to unsuspecting human consumers posed new questions about food safety and health, questions that ultimately led to the building of municipally-run slaughterhouses not only in Berlin, but throughout Germany.<sup>6</sup>

In my talk this afternoon, I want to investigate how the growing scientific understanding about the transferability of diseases from animals to humans raised new concerns about food safety in Germany, which, in turn, became the primary impetus for slaughterhouse reforms in the second half of the nineteenth century and which even instigated a diplomatic crisis between Germany and the United States in the mid-1890s. I argue that scholars who are interested in the underlying causes of

historical transformations ought to sometimes look beyond the intentionality of human agency to also recognize the often crucial role of non-human elements and their unintended consequences on the course of history.

### Trichinosis as Scientific Discourse

Trichinosis was not a new phenomenon.<sup>7</sup> It had existed for centuries, but before the invention of the microscope, *Trichinella spiralis*—the small organism responsible for the outbreak of the disease—had evaded human visual perception and medical consciousness. *Trichinella spiralis* was first discovered in the eighteenth century, but it did not gain medical significance until 1835 when James Paget, then a demonstrator of anatomy at London's St. Bartholomew hospital, detected trichinae in the breast muscle of a seventy-year-old man who had supposedly died of cancer.<sup>8</sup> Later that same year, Richard Owen classified this parasitic roundworm as part of the phylum *Nematoda*.<sup>9</sup> It took another twelve years before a Philadelphia veterinarian discovered *Trichinella spiralis* in pigs. Initially, the trichina worm was perceived as a zoological curiosity, but beginning in the 1850s, it increasingly sparked the interest of a wider scientific community. Pathologists, veterinarians, and other medical practitioners began to investigate the prevalence and spread of trichinae in a number of organisms, hoping to generate scientific explanations about the origins and spread of this parasite.<sup>10</sup> Feeding experiments with dogs, rabbits, pigs, horses, and birds, to name but a few, revealed that carnivorous animals were the only viable hosts for these parasites. However, since this category included humans, trichinae generated growing interest among doctors and anatomists.<sup>11</sup>

Starting in the late 1850s, pathologists began to record the occurrence of trichinae in human corpses. For instance, the acclaimed Berlin pathologist Rudolf Virchow reported that in 1859 alone, he had recorded six cases. However, he insisted that this figure constituted only a fraction of the actual numbers because doctors rarely bothered to look for such parasites.<sup>12</sup> His Dresden colleague F.A. Zenker even estimated that one in thirty-four corpses revealed trichinae infestations.<sup>13</sup> It was also Zenker who first identified how trichinae were transferred from pigs to people and how the disease subsequently progressed in human organisms, leading to a potentially deadly outcome. As another well-known medical researcher put it, "Zenker is the real discoverer of trichinosis, and actually we should call trichinosis Zenker's disease."<sup>14</sup>

Trichinosis was a rather curious disease. Its cause was neither viral nor bacteriological, but parasitic. The fact that tiny worms could invade and paralyze human bodies was not only a painful experience for those

who had ingested these parasites, it also generated widespread fears among the public at large because trichinosis was a silent killer that could strike anyone who ate pork. The trichina was invisible to the naked eye, tasteless, and not even pigs, for the most part, gave any indication of illness. Trichinosis raised the awareness that a food, which was supposed to nourish, could actually kill, and that it could do so without any visible indications of danger. People had always known that a bad cut of meat could make a person sick, but the trichinae revealed that meat could be dangerous without smelling rotten or looking putrefied. This realization raised new concerns about the safety of meat and the nature of food-borne illnesses. As a result, it generated much medical interest and publicity. Newspapers, medical journals, and even butchers' publications frequently reported about this problematic. By the mid-1860s, trichinosis clearly had become part of medical and popular discourses, yet it still remained to be seen how this knowledge would be used and what effect it would have on the production and consumption of meat.

### From Scientific Theories to Municipal Policies

Although the disease had been identified, a substantial problem remained because it continued to be unclear how trichinosis could be detected and, more importantly, how it could be prevented in pigs as well as in humans. Numerous scientific publications took up this question in the hope of transforming scientific theories into practical solutions. Among them were Rudolf Virchow's 1866 *Die Lehre von den Trichinen* (*The Study of the Trichinae*) and Friedrich Küchenmeister's 1867 *Ueber die Nothwendigkeit und allgemeine Durchführung einer mikroskopischen Fleischschau* (*About the Need for and General Implementation of Microscopic Meat Inspection*). Both had conducted extensive experiments, which had shown that heating meat above 60°C would kill any existing trichinae. Consequently, they advised that all meat should be cooked until it reached at least that temperature.<sup>15</sup> This seemingly simple solution to the threat of trichinosis, however, posed its own set of problems. For one, most people did not possess thermometers to accurately determine the temperature of their food. In fact, many, especially poor, households did not even have proper cooking facilities, nor did they often have the time and knowledge to correctly prepare their meals. And poverty was not the only problem; habits and food preferences were also an issue. As the experience of recent trichinosis epidemics had shown, the consumption of raw meat, which was a widespread practice in eastern and northern Germany, posed the main threat. But even if meat was cooked, it was still not necessarily safe. As long as there were any raw parts or remaining meat juices, the risk of trichinosis remained; hence, even a roast was potentially

dangerous, because often it was not cooked all the way through. Bacon and smoked hams according to Virchow and Küchenmeister also posed serious risks because the curing and smoking was often carried out at low temperatures and only for a brief period.<sup>16</sup> In addition to raw meat, sausages also posed dangers. Not only were they made from many (often unidentifiable) parts of a pig; usually they were not cooked at all. Finally, there was always the problem that meat was not stored properly or kept for too long. Doctors and other health officials repeatedly appealed to the public to cook meat adequately, but they also realized that protective measures would have to be implemented elsewhere if trichinosis prevention was to be effective.

Obvious targets were, of course, the pigs themselves. Both Virchow and Küchenmeister insisted that pigs had to be kept clean and healthy. Their pens should be dry, warm, and well ventilated. The floors should be covered with cement rather than wood to keep out vermin that might carry diseases. Their food should be supervised, especially since pigs were known to eat just about anything, including small animals, bugs, and excrement. Yet Virchow and Küchenmeister were well aware that the total control of pigs was not possible. In the nineteenth century, when most livestock still went to pasture, pigs often roamed in the woods, thus making it difficult to keep track of their food intake. Moreover, given that most pigs were kept on small farms or even in private households, it was impossible to impose any specific standards for feeding and shelter.

The risk of livestock diseases was always high, and trichinosis posed a particular problem. Not only was it difficult to prevent pigs from ingesting trichinae, which they could get from eating mice, feces, or even kitchen garbage containing meat, it was also next to impossible to detect trichinosis in living pigs because, for the most part, pigs did not exhibit any recognizable symptoms of illness.<sup>17</sup> This absence of visible symptoms in living pigs meant that veterinary inspections prior to slaughter, while useful for the detection of numerous other diseases, could not be used to ward off trichinosis. Different methods of prevention would have to be devised.

Most of the experts agreed that the only method to detect trichinae was through the microscopic inspection of the animals' flesh immediately after they were slaughtered. Hence, most publications of the 1860s called for the immediate implementation of such inspections as the only viable means to ensure consumer safety.<sup>18</sup>

Describing how such inspections should be carried out, researchers explained that several muscle-tissue samples from different parts of the slaughtered pig, e.g., lungs, tongue, and legs, should be taken and closely investigated under an appropriate microscope.<sup>19</sup> For proper meat inspections, microscopes were a key prerequisite because only through them

would tiny parasites become visible to the human eye. Apart from microscopes, such inspections required trained personnel. Declaring that laymen could not recognize trichinae, Küchenmeister and Virchow insisted that only doctors and veterinarians should be entrusted with this task.

With their call for microscopic meat inspection, scientific experts expressed their concerns about consumer health, while at the same time asserting their authority over questions regarding nutrition and food safety. The increasing number of studies and reports about trichinosis, as well as the growing publicity about outbreaks like the one in Hedersleben, generated debates that brought the knowledge of veterinary and medical scientists into the public limelight and political arena.

Pleas for meat inspection, which centered on questions of food safety, also had a political undercurrent that exemplified how scientific discourses were increasingly becoming entangled with state authority, not only because the state appropriated scientific domains, but also because scientific experts themselves called for state intervention. Most medical experts seemed to agree that food safety and the protection of the public from animal diseases was the responsibility of state agencies which should not only provide the legal basis for enforcing meat inspection, but which should also see that inspections were carried out correctly, because butchers could not necessarily be trusted. Surely, individuals also had to take precautions, but doctors believed that the question of meat quality reached beyond the grasp of individual consumers. It was a matter of public welfare that needed to be addressed by higher authorities, i.e., by specially trained personnel and, ultimately, by the municipality and the state. Thus, a much larger issue loomed beneath the call for meat inspection, for as B. Rupprecht, a medical professor at the University of Berlin, stated, "If microscopic meat inspection is to be truly safe, it must be legally enforced in small towns and in the country, and in large cities it must also be connected with public abattoirs."<sup>20</sup> Most proponents of meat inspection realized that it would not be possible to enforce such measures if butchers continued to slaughter in their own shops. Already a year before the Hedersleben outbreak, the Berlin Medical Society had insisted that "a conscientious meat inspection can only be achieved through public slaughterhouses."<sup>21</sup>

### Legal Interventions and Official Initiatives

Attesting to the urgency of such reforms, the Prussian Ministry of Interior introduced a new slaughterhouse law on March 18, 1868, declaring:

In those communities where a public facility for the slaughter of livestock exists, it can be ordered through a city ordinance that

within the community district or in part of it the slaughter of particular kinds of livestock as well as certain connected trades may only be performed in the public slaughterhouse.<sup>22</sup>

The law entitled communities to establish such facilities. Moreover, the law stated that “[F]ollowing the establishment of a public slaughterhouse, a further ordinance can be passed to enforce the inspection of all livestock to determine the animals’ health before and after slaughtering.”<sup>23</sup> Such inspections were to be carried out by veterinarians or other qualified personnel. This law, which became known as the *Schlachtzwanggesetz*, underscored that the establishment of public slaughterhouses was closely linked to the implementation of veterinary inspections.

However, the ratification of this law did not yet amount to actual change because even though it enabled communities to build public abattoirs, it did not require them to do so. Nevertheless, numerous cities did. According to an 1890 census, ninety-four German cities, among them Berlin, Breslau, Cologne, Hamburg, Frankfurt, and Munich, operated such facilities. In Berlin, due to municipal quarrels that I cannot explain here, it had taken over a decade until the city’s public slaughterhouse was opened in 1881, but once it did, the Zentral-Viehhof quickly emerged as an exemplary site for the enforcement of veterinary and meat inspections. Not only did veterinarians inspect all livestock following its arrival at the train ramps, but samples of its flesh were examined right after slaughter. The microscopic inspection of pigs for trichinosis received particular attention. In Berlin, special trichinosis labs were established right at the Zentral-Viehhof. Initially, 64 inspectors worked in these labs, but by 1910, attesting to the growing significance of such inspections, 370 specially trained trichinosis investigators were employed at the Zentral-Viehhof alone, many of them women, because they were believed to be especially rigorous. As one administrator somewhat cynically claimed, “It is well known that women, once they have become suspicious, see much better than men. This characteristic, while quite unpleasant in many instances, is definitely an advantage when it comes to trichinae inspections.”<sup>24</sup>

To be sure, trichinosis was not only a problem in Germany, but in many countries where pork was a popular food, including most of eastern and northern Europe, as well as the United States. In Denmark, for instance, trichina worms were regarded a public health threat requiring police attention. However, nowhere were postmortem meat examinations as stringent as in Germany. In fact, fears about trichinosis were so deep-seated that efforts at controlling this disease did not stop at the German borders. The growing availability of imported meats in the 1880s and 1890s, particularly from the massive meat packing plants of Swift and Armour in Chicago, generated additional concerns about the safety of

pork, especially since an increasing number of German visitors to Chicago reported about the abhorrent hygiene and health standards they witnessed in those slaughterhouses. As one visitor to Armour's factories wrote: "Here time is money. In this place where seven pigs are slaughtered every minute in buildings made of wood rather than concrete, hygiene and proper meat inspections cannot exist."<sup>25</sup>

Alarmed by such reports, German health officials began to conduct their own investigations of U.S. meat imports, especially with regard to trichinae. One 1893 study of the Kaiserliche Gesundheitsamt estimated that about three in every one hundred cans of Armour hams showed traces of trichinae infestations. While this might not sound like much, it was enough to lead examiners to complain to the German Ministries of Health and Commerce who, in turn, contacted the Foreign Ministry to demand immediate action. The latter quickly complied by sending German embassy officials to Chicago to investigate the situation. Their subsequent report, which only further solidified existing concerns, generated a substantial and increasingly hostile correspondence between governmental agencies in Chicago, Washington, and Berlin. German officials demanded that U.S. federal agencies implement meat inspections to test for trichinae and other potential health hazards. By late 1894, German-American negotiations had reached such an impasse that German officials threatened that if such inspections were not immediately imposed, all imports of American meat would be halted. And indeed in January 1895, Germany as well as a number of other European countries that had joined Germany's efforts did impose an import stop on most American pork products; however, this did not yet mark the end of the affair, particularly on the side of the Americans. Furious about the audacity of European governments, many U.S. officials felt that Europeans, and especially the Germans, rather than acting on actual threats posed by American-produced meat, were simply trying to boycott American products in favor of marketing their own meats. As the *Washington Evening Star* reported on March 3, 1895:

It is well understood by the president and Secretary of State and all of the cabinet officials interested in the question that the health plea made against our products which are excluded by Germany, France, Belgium, the Netherlands, and Denmark is merely a diplomatic excuse and the prohibitions are believed to be but the beginning of a tariff war against the United States.<sup>26</sup>

Numerous officials advocated that the U.S. government also should impose stricter import regulations, and even make use of the 1890 flag law, which stated that additional tariffs could be collected from any country deemed to discriminate against American products.<sup>27</sup> Yet, President

Cleveland apparently was reluctant to make use of the flag law because such import restrictions would have harmed the American economy more severely than the European. Instead, the Cleveland administration decided to bow, albeit reluctantly, to European pressures by implementing federal trichinosis inspections on all pork products intended for export to Europe. At the same time, no such inspections were mandated for meats sold in the United States. American consumers had to wait another decade until federal meat inspections were imposed in the United States following the publication of Upton Sinclair's 1905 novel *The Jungle*.

## Conclusion

In conclusion, then, I would like to make the following three points about why it might be worthwhile to look at parasites and their place in history. The first is about micro-history. Micro-historians emphasize the significance of conducting small-scale localized studies that focus on the everyday experiences of ordinary people. Parasites lend themselves not only to a micro-history, but even a microscopic history that commences very locally—inside the bodies of certain animals and humans. This would perhaps be of little historical interest in itself if this story ended there. But of course it does not. Rather the history of parasites often sheds light on the intricate linkages between everyday practices—in the case of trichinae, food consumption—public health, and scientific knowledge production, as well as the transfer of this knowledge into political discourses and policy making and back into the arena of everyday life. Hence, parasites enable us, on the one hand, to offer “thick descriptions” (even if somewhat disconcerting ones), while on the other hand also making it possible to move from the very small existence of a worm to the quite large-scale implications it generated, not only on a local but on a national and even international stage. Parasites, viruses, and bacteria can indeed have quite remarkable careers, as trichina worms amply demonstrated. Not only did they function as crucial instigators of German slaughterhouse reforms, they also led to the internationalization of meat inspections.

This leads me to my second point—the transnationality of the history of disease. As we all know about the plague, cholera, or even more recent examples like SARS, epidemic diseases do not conform to national boundaries. In that sense, they necessarily link different geographical regions, but they also forge transnational bonds on a different, less territorial, scale, since disease control often requires international cooperation, not just in the realm of politics, but through scientific knowledge exchange. Trichinosis attests to how the growing globalization of food consumption also intensified the internationalization of politics and diplomacy (or the breakdown thereof) as well as knowledge exchange.

Moreover, this example should also serve as a reminder that when looking at transatlantic history, we should not only examine the Americanization of Europe, but that we should also look in the other direction to learn more about the Europeanization of America.

My third and final point also revolves around interchange, but interchange of a different sort, namely between humans and non-human organisms. While I certainly do not mean to suggest that parasites should be considered as historical agents who intentionally shape the course of history or even their own existence, I would like to suggest that in order to grapple with the complexities of historical change, we might need to expand our conception of what constitutes our historical universe. For quite some time now, scholars have abandoned the idea that the past is mainly his story. Perhaps now it is also time to embrace larger notions concerning the web of life by incorporating the non-human, and even the microscopically small, into our conception of the past, particularly when thinking about the role of the body in history. After all, history is not simply a matter of the mind or the heart, but at times, it also goes through the stomach.

## Notes

<sup>1</sup> *Volkszeitung* (8 December 1865).

<sup>2</sup> The doctors concluded that this habit of eating raw or undercooked meat was the main reason why the poor had been especially susceptible to this illness. Indeed, of the twenty-seven laborers from the workers' barracks, twenty-six would die.

<sup>3</sup> *Volkszeitung* (16 December 1865).

<sup>4</sup> B. Rupprecht, *Die Trichinenkrankheit im Spiegel der Hettstädter Endemie betrachtet* (Hettstädt, 1864), 6.

<sup>5</sup> Rudolf Virchow, *Die Lehre von den Trichinen* (Berlin, 1866), 32. For reports about individual cases, see, for instance, Behrend, "Ein Fall von Trichiasis," *Deutsche Klinik* 15 (1863): 293–295; L. Landois, "Zwei neue Endemien durch Ansteckung mit *Trichinella spiralis*," *Deutsche Klinik* 15 (1863): 29–32; G. Simon, "Eine Epidemie von akuter Trichinenerkrankung in Calbe a.d.S.," *Preußische Medicinal Zeitung* 5 (1862): 297–301, 305–7; and C. Wolff, "Eine Trichinen Epidemie in Westpreußen," *Virchows Archiv* 34, no. 1 (1865): 230–3.

<sup>6</sup> Stefan Tholl, *Preußens blutige Mauern: Der Schlachthof als öffentliche Bauaufgabe im 19. Jahrhundert* (Walsheim, 1995).

<sup>7</sup> It has not been established with certainty if there had been any knowledge of this disease prior to the nineteenth century, but many interpreters of the Jewish and Muslim prohibition of pork have attributed this taboo to concerns about trichinosis.

<sup>8</sup> William Campbell, "History of Trichinosis: Paget, Owen, and the Discovery of *Trichinella spiralis*," *Bulletin of the History of Medicine* 53 (1979): 520–52. Campbell also discusses the dispute between Paget and Owen over who deserved credit for discovering and naming this roundworm.

<sup>9</sup> Richard Owen, "Description of a Microscopic Entozoon Infesting the Muscles of the Human Body," *Transactions of the London Zoological Society* 1 (1835): 315–24.

<sup>10</sup> See for example, A. Fiedler, "Beiträge zur Entwicklungsgeschichte der Trichinen," *Archiv der Heilkunde* 5 (1864): 1–29; G. Herbst, "Beobachtungen über *Trichinella spiralis*," *Nachrichten*

der G.A. Universität zu Göttingen 19 (1851): 257–64; F. Küchenmeister, *Die in den und an dem Körper des lebenden Menschen vorkommenden Parasiten: Ein Lehr- und Handbuch* (Leipzig, 1855); R. Leukart, *Untersuchungen über Trichinella spiralis* (Leipzig, 1860); Probstmayr, “Zur Trichinenfrage,” *Virchows Archiv* 30 (1864): 265–6; and R. Virchow, “Helminthologische Notizen,” *Virchows Archiv* 18 (1860): 330–46.

<sup>11</sup> Rupprecht, *Die Trichinenkrankheit im Spiegel der Hettstädter Endemie betrachtet*, 6–7. He lists more than twenty names of international scholars who had added to the knowledge of this smallest of animals. Even today, humans are considered one of the main hosts of trichinae next to pigs and rats. J. F. Gracey, ed., *Thornton's Meat Hygiene* (London, 1981), 314.

<sup>12</sup> Virchow, “Helminthologische Notizen,” 330.

<sup>13</sup> F.A. Zenker, “Die Trichinenkrankheit des Menschen,” *Virchow's Archiv* 18 (1860): 561.

<sup>14</sup> Rupprecht, *Die Trichinenkrankheit im Spiegel der Hettstädter Endemie betrachtet*, 7.

<sup>15</sup> Incidentally, today trichinae are destroyed by freezing pork to -15°C. Gracey, *Thornton's Meat Hygiene*, 317.

<sup>16</sup> Virchow, *Zur Trichinenlehre*, 41.

<sup>17</sup> Pigs were usually not infested with enough trichinae to display any symptoms. Only some of them exhibited discomfort, lack of appetite, and fever. See Gracey, *Thornton's Meat Hygiene*, 316.

<sup>18</sup> Küchenmeister, Rupprecht, Virchow, and Zenker were, of course, among the proponents.

<sup>19</sup> Virchow maintained that microscopes with an enhancement of fifty to one hundred times were sufficient to detect the presence of any *Trichinella spiralis*.

<sup>20</sup> Rupprecht, *Die Trichinenkrankheit im Spiegel der Hettstädter Endemie betrachtet*, 165.

<sup>21</sup> A. C. Feit, *Bericht der zur Berathung der Trichinen-Frage niedergesetzten Commission der medicinischen Gesellschaft zu Berlin über öffentliche Schlachthäuser* (Berlin, 1864), 15.

<sup>22</sup> “Motive zu dem Gesetz-Entwurfe, betreffend die Errichtung öffentlicher, ausschließlich zu benutzender Schlachthäuser,” in *Gesetz-Sammlung für die königlichen Preussischen Staaten*, 51 (Berlin: R.V. Decker, 1868), 7–9.

<sup>23</sup> *Gesetz-Sammlung für die königlichen Preussischen Staaten* 23 (Berlin, 1868), 277–81.

<sup>24</sup> Anonymous, “Die Fleischschau,” (May 1887), in Landesarchiv Berlin, Stadtarchiv, Magistrat zu Berlin Rep. 05–03/1 Finanzbüro, Nr. 13040 “Das städtische Fleischschau-Amt,” vol. 3.

<sup>25</sup> Hussle, “Die Schlachthöfe von Chicago,” *Zeitschrift für Fleisch und Milchhygiene* 5 (1894): 267.

<sup>26</sup> *Washington Evening Star* (3 March 1895).

<sup>27</sup> Such tariffs could range from 10 percent higher fees to the total exclusion of foreign products.