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## America's First Medical Breakthrough: How Popular Excitement about a French Rabies Cure in 1885 Raised New Expectations for Medical Progress

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BERT HANSEN

WHEN LOUIS PASTEUR ANNOUNCED THE SUCCESSFUL INOCULATION of a human with his experimental rabies vaccine in 1885, he was already well known to the French public. The chemist had been celebrated in France for both intellectual and practical achievements: preventing spoilage of wine and beer, saving the silk industry from a silkworm disease, establishing the importance of molecular asymmetry, and inventing a vaccine to save cows and sheep from anthrax. Across the Atlantic, however, his science and his name were familiar to only a small number of Americans, largely younger physicians who had recently completed medical training in Europe. The survival of the first rabies victim to be treated by Pasteur's method seemed likely to be quickly forgotten in America with no lasting effect on popular consciousness. News coverage of Pasteur's discovery was hardly remarkable. The *New York Herald*, for example, announced it as part of a cable dispatch from Paris on October 29 and reported reactions by New York doctors and the American Society for the Prevention of Cruelty to Animals (ASPCA) on October 30. Another cable dispatch on November 1 was followed by more about local physicians' responses on November 3. A cable to the *Herald* mentioned it on November 8. Reports in the *New York Times* and the other papers gave it no greater attention. Then nothing more appeared until a local event made it newsworthy again.

On December 2, a new element entered the picture when a dog ran through the early morning streets of Newark, New Jersey, biting seven other dogs—and six children. This event made the afternoon papers. The day after the children were bitten, a local physician wrote to a local newspaper urging that the children be sent immediately to Paris for the new treatment and asking the public to contribute to

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their expenses if the children's families could not afford it.<sup>1</sup> Within hours, workmen had collected donations and brought them to the office of this doctor, William O'Gorman. By cable, Pasteur was asked if he would receive the children; the papers carried his fast and precise reply in the original French: "Si croyez danger envoyez enfants immediatement" (If you think there is danger, send children immediately).<sup>2</sup> Arrangements were made for passage a few days later on a French steamer; more donations were accepted, with contributors' names printed in the newspapers. As interest in the boys' story grew, the press expanded its attention to include their families, the donation of warm clothing for their winter voyage across the North Atlantic, Pasteur's other discoveries, supposed remedies for hydrophobia, the problem of stray dogs in American cities, methods of dog control (the impounding, shooting, poisoning, or drowning of "stray curs"), the variety of opinions among local physicians and medical professors on hydrophobia, the mechanism of the inoculation process, Pasteur's experiments, the germ theory in general, and the outfitting of a hospital room in the steamer. Indeed, the boys' trip to Paris would create a media sensation across the United States and Canada. By this small accident, initially of only local interest, a trickle of modest news reports about a scientific announcement was abruptly transformed into a national torrent of news articles, features, illustrations, editorials, jokes, letters to the editor, cartoons, and even political satire. The sensation would last several months and catapult Pasteur and medical research to celebrity across North America.

THE NEWARK BOYS' TRIP TO PARIS is a story worth telling in its own right, but a second goal of this study is to suggest that the adventure prompted so much sustained attention by the press and the public as to change popular expectations about medicine more generally. When American newspaper and magazines devoted extravagant attention to the first Americans treated with Pasteur's brand-new rabies "cure," they were not simply reporting an event with broad human-interest elements, they were also elaborating a story of medical discovery as something useful and exciting to ordinary people. In the process, they were cultivating a sensation about medicine's being newly powerful, about scientific knowledge that makes a difference in a public arena beyond the walls of the medical school and the laboratory. As a result, Pasteur's rabies treatment, while far from the greatest discovery of the age and not connected with the United States except by accident, stimulated a series of events and expectations that set a pattern through which later discoveries would be experienced.<sup>3</sup>

<sup>1</sup> *Newark Daily Journal* (December 3, 1885), front page. Papers that have been searched for this story include Newark's *Daily Advertiser*, *Daily Journal*, *Evening News*, *Morning Register*, *Sunday Call*, New York's *Daily Graphic*, *Evening Post*, *Herald*, *Sun*, *Times*, *Tribune*, and *World*, and Brooklyn's *Eagle*.

<sup>2</sup> *Newark Daily Journal* (December 4, 1885): 1, col. 3.

<sup>3</sup> Historians' attention to the Newark boys' adventure—and to the importance of the rabies treatment altogether—has been surprisingly limited. Many have ignored the rabies triumph altogether, probably because the incidence of rabies was so low compared to cholera, tuberculosis, typhoid, diphtheria, and other infectious diseases of the late nineteenth century and also because the treatment was not based, as were several others, on the positive identification of the infecting microorganism. One typical comment by a leading historian of medicine reads: "Painstaking laboratory investigation had already produced ways of controlling some diseases, but not those that had much relation to medical

These subsequent events and the new patterns will be considered below after examining the initial historical episode, but it may be helpful at this point to explain that I use the word "breakthrough" (popularized in our era, not theirs) simply to designate the now commonplace phenomenon of a publicly recognized major advance in science or technology. Not all advances are experienced as breakthroughs in this sense; some significant changes are not widely recognized, either because they are not useful (or are not seen as such) or because they develop by gradual steps without having a concentrated impact. While a theory of breakthroughs is beyond the scope of this article, it should be noted that a new idea or invention is in general more likely to become a breakthrough to the extent that the advance is seen as large, sudden, useful, already realized rather than just potential, and of interest to a wide public. These five possible attributes of a discovery are often mutually interdependent, but each is analytically important. Taken together, they highlight the most important general feature of a breakthrough: it is a social phenomenon; it exists only if it is something widely noticed at the time.

As we shall see, several months of incessant attention to laboratory science prompted by the rabies vaccine helped to create new iconography and new institutions. In the process, an entirely new idea became embedded in popular consciousness: that medical research could provide widespread benefits. This new expectation about progress would help to displace a centuries-old understanding (shared by physicians and patients alike) that little ever changed in medicine. Well into the nineteenth century, writings of Hippocrates and Galen had remained useful guides to medical theory and practice, not just to professional ethics and ideals.

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practice in America. The work of Pasteur, for example, had been fruitful in benefits, but anthrax and chicken cholera had no real relevance to American practitioners; the vaccine against rabies was not available, and in any case rabies was relatively rare. The discovery of the tubercle bacillus had led to great diagnostic benefits but not to any therapeutic advance. The great breakthrough came with the researches on diphtheria." Lester S. King, *American Medicine Comes of Age, 1840-1920* (Chicago, 1984), 35.

On the occasions when historians of medicine have expanded their view to consider popular awareness of discoveries, it is the diphtheria serum breakthrough that they cite as the first instance. For example: "Diphtheria antitoxin, the first biological drug to be produced by scientific medicine, dramatically demonstrated the possibilities of a bacteriological understanding of disease." Jonathan M. Liebenau, "Public Health and the Production and Use of Diphtheria Antitoxin in Philadelphia," *Bulletin of the History of Medicine* 61 (1987): 216-36, at 216. Edward Shorter observed, "The sensation that the drug [diphtheria antitoxin] caused among the public was important in fostering the image of the doctor as a miracle worker." He later added, "to the extent that we can give any precise date to the crystallizing of the public infatuation with medical science, I think it would be the arrival in 1894 of the first diphtheria 'antitoxine.'" He called the New York response to the diphtheria treatment "a media sensation" and "a media spectacular." See Shorter, *Bedside Manners: The Troubled History of Doctors and Patients* (New York, 1985), 96, 131, 132. Paul Starr wrote, "Pasteur had discovered a vaccine against rabies, . . . but rabies was a relatively uncommon disease. The first major therapeutic application of bacteriology—diphtheria antitoxin—did not come until the mid-1890s." Starr, *The Social Transformation of American Medicine* (New York, 1982), 135. Henry Blumenthal's interesting study, *American and French Culture, 1800-1900: Interchanges in Art, Science, Literature, and Society* (Baton Rouge, La., 1975), missed the significance of the rabies episode entirely. In "The Reception of Pasteur's Rabies Vaccine in America: An Episode in the Application of the Germ Theory of Disease" (master's thesis, University of Wisconsin, April 1987), Jon M. Harkness made changes in the profession the center of his study but included as well some comments on the *New York Times* coverage and popular interest. A sketch of this episode, presented at a centennial celebration of the Pasteur Institute in 1988, was published without illustrations as Bert Hansen, "La réponse américaine à la victoire de Pasteur contra la rage: Quand la médecine fait pour la première fois la 'une,'" in *L'Institut Pasteur: Contributions à son histoire*, Michel Morange, ed. (Paris, 1991), 89-102.



Even with important new understandings under way by the 1880s in anatomy, physiology, cell biology, and bacteriology, medicine had seen very few successful therapeutic advances and none that made a sensation in the press. Yet, while the medical breakthrough was a novelty in 1885, press coverage of medical subjects was not. In the second half of the nineteenth century, American newspapers commonly ran stories on local disease outbreaks, epidemics near and far, accidents and injuries (including dog bites, food poisoning, medical and pharmacy malpractice cases), medical and scientific meetings, discoveries about disease, and the plans, policies, scandals, and failures of sanitary reform. Still, until late 1885, one would search in vain for a generally acknowledged and widely reported triumph, for any dramatic advance in the power of doctors to change the outcome of a person's illness. Although mechanical inventions by Thomas Edison and others had generated grand enthusiasms at times, a medical development had never before captured the headlines with sustained popular attention in America.<sup>4</sup> Clearly, an important feature of the rabies vaccine distinguishing it from other developments of germ theory was that it was used as a therapy, not a preventive. It was technically the latter, as the injections were given to healthy people after a dog bite but prior to the onset of any disease symptoms. Yet, because people feared bites from a suspicious dog as tantamount to getting hydrophobia, this procedure was universally, if not accurately, viewed as a cure. This common misconception is important because, in the emotional ranking of popular enthusiasms, knowledge about disease without immediate application is hardly worth noting, preventives are mildly interesting, therapies are far more appealing, and successful cures (whether real or apparent) hit the top.

An appreciation of the feelings and attitudes in this enthusiasm is what I am seeking in the headlines, stories, pictures, cartoons, and popular entertainments that were spawned by the rabies cure. My approach thus differs from that of the substantial scholarship on the "popularization of science and medicine," which is primarily interested in the intellectual content of what the public learned (or could learn) from the press about nature and nature's laws (even in possibly distorted form).<sup>5</sup> The focus here is on changes in what ordinary people saw, read, thought, felt, and came to expect about science and medicine as enterprises, about research and discovery, about a human triumph and the potential for more such successes.<sup>6</sup>

<sup>4</sup> See Wyn Wachhorst, *Thomas Alva Edison: An American Myth* (Cambridge, Mass., 1981).

<sup>5</sup> Recent studies of the popularization of health and medicine in America include Rima D. Apple, *Vitamina: Vitamins in American Culture* (New Brunswick, N.J., 1996); John C. Burnham, *How Superstition Won and Science Lost: Popularizing Science and Health in the United States* (New Brunswick, 1987); Marcel C. LaFollette, *Making Science Our Own: Public Images of Science, 1910–1955* (Chicago, 1990); Andrew McClary, "Germs Are Everywhere: The Germ Threat as Seen in Magazine Articles, 1890–1920," *Journal of American Culture* 3 (1980): 33–46; Dorothy Nelkin, *Selling Science: How the Press Covers Science and Technology* (New York, 1987); Matthew D. Wahlen and Mary F. Tobin, "Periodicals and the Popularization of Science in America, 1860–1910," *Journal of American Culture* 3 (Spring 1980): 195–202; and Terra Ziporyn, *Disease in the Popular American Press: The Case of Diphtheria, Typhoid Fever, and Syphilis, 1870–1920* (Westport, Conn., 1988). Although the subject of Nancy Tomes's study is not the popular media per se, she has examined an important form of popularization in her article, "The Private Side of Public Health: Sanitary Science, Domestic Hygiene, and the Germ Theory, 1870–1900," *Bulletin of the History of Medicine* 64 (1990): 509–39. Negative dimensions to the popularizing of medical ideas and to the press coverage of medical triumphs are revealed in Judith Walzer Leavitt, *Typhoid Mary: Captive to the Public Health* (Boston, 1996), see esp. chap. 6.

<sup>6</sup> Recent work in literary criticism under the general rubric of reader-response studies has

WHILE THE IMAGE OF AMERICAN NEWSPAPERMEN RUSHING to get the latest news off the press and into the hands of waiting readers goes back to Benjamin Franklin, it was only new industrial technologies of the mid and late nineteenth century that made it possible to bring the same news at the same time to masses of people. These changes made possible new sensations of many kinds, including the medical breakthrough. High-speed rotary presses powered by steam replaced the hand-cranked flat-bed mechanism of Franklin (which had differed little from its Gutenberg ancestor). By the mid-nineteenth century, newspapers could roll off the presses at the rate of tens of thousands per hour. The introduction of the telegraph, followed by the laying of a transatlantic cable, improved access to the latest happenings. As the country became united by a network of railroads, editors everywhere could easily draw on other editors' long stories about faraway events for a local audience. Additionally, as newspapers moved further from their origins as organs of political parties and more aggressively sought unaffiliated readers, especially new immigrants, they used both hot news and human interest stories to attract readers. Joseph Pulitzer successfully exploited these developments and helped reshape an entire industry. Although he was hardly alone and although his paper was to play a smaller role in the Pasteur/hydrophobia mania than the *New York Herald* of James Gordon Bennett, Jr., Pulitzer's move to New York from St. Louis in 1883 to purchase the *New York World* was a major step in escalating the pursuit and creation of newsworthy sensations.<sup>7</sup>

To appreciate the novelty of Americans in the 1880s starting to regard medicine as innovative and seeing it as scientific—with discoveries made in laboratory experiments and research workers looking like heroes, even saviors—requires an understanding of the feebleness of American medicine at that time. Given the high status accorded twentieth-century medicine and its rapid pace of change, it is sometimes difficult fully to comprehend the limited place of innovation and science in American medicine during the 1880s.<sup>8</sup> In contrast to Europe, with its centuries-long tradition of university-

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cultivated an appreciation of the fact that individual readers do not simply absorb texts of books, newspapers, or magazines passively, uncritically, or unselectively. The present study does not challenge that new approach but endeavors rather, in a more traditional fashion, to discern the general level of social awareness through the evidence of popular and widely disseminated publications. As will be argued below, editors, publishers, their writers, and especially their cartoonists could not diverge far from widely held ideas and images, even as they were challenging them in part or trying to move them in new directions. The importance of the potential gap between what is on the page and what is held in an individual reader's mind for certain studies of literature becomes negligible here in considering the broad lines of popular awareness, enthusiasms, and understanding based cumulatively on an enormous mass of widely dispersed articles and images. Furthermore, while the wide popular enthusiasm examined here could not have existed without an active press involvement, it consisted of the thoughts, feelings, and actions of multitudes of people; it was not simply something that existed only in the pages of the newspapers and magazines. Texts and pictures have thus been taken herein as evidence both of press coverage and of events themselves that existed apart from the press attention to them.

<sup>7</sup> In Michael Schudson's vivid phrasing, "Pulitzer plugged his Western voice into the amplifier of the East, New York City." *Discovering the News: A Social History of American Newspapers* (New York, 1978), 92. Schudson charts how fast and wide was the expanded circulation that Pulitzer engineered: from 15,000 at purchase in 1883 to 60,000 in 1884, then to 100,000 in 1885, and 250,000 by the fall of 1886. The pursuit of sensation is usually seen as culminating in the rise of "yellow journalism," often symbolized by William Randolph Hearst's takeover of the *New York Morning Journal* in 1895. In addition to Schudson, see John D. Stevens's brief account of the 1890s in *Sensationalism and the New York Press* (New York, 1991), 57–100.

<sup>8</sup> Some efforts by leaders in medicine to make their profession more scientific in this era are

based medical education, in America an apprenticeship or a few terms of lectures in a small school unaffiliated with a university was the medical education of most physicians (except for a small elite who completed their medical preparation with further training in Vienna, Paris, London, or Edinburgh). Admission to medical schools did not require prior college study or even a high school diploma during this era. Few medical schools taught basic sciences or gave instruction in the use of microscopes or other laboratory apparatus. It was only in 1884 that the first medical research laboratory in America was established, when the industrialist Andrew Carnegie donated the funds to the Bellevue Hospital Medical College in New York City.

Also in 1884, the railroad magnate William Henry Vanderbilt offered a half-million dollars to aid the expansion of another New York City medical school, the College of Physicians and Surgeons. But in marked contrast to the post-Pasteur world of experimental and scientific medicine where such a donation would be universally praised, this act was satirized in glowing color on the cover of a popular magazine as a threat to people's health and as a boon only to avaricious medical students and undertakers. (See Figure 1.) Puck tries to hold Carnegie and his bag of money back from the welcoming hands of a medical school dean, surrounded by professors and students waving their surgical saws. Celebrating the gift is a smiling funeral director at "Crape & Plantem Undertakers," where a coffin-shaped sign lists the firm's professional "references: Dr. Give-em-up, Dr. Kill-em, and Dr. Skinner." Characteristically, in the period prior to a popular recognition of the fruits of scientific and laboratory medicine, doctors were visually identified by saws and scalpels. Only after 1900 would the stethoscope, the hypodermic syringe, the thermometer, and white surgical garb become the regular iconography of a physician.<sup>9</sup>

Low estimates of the value of health care were widespread, and they were sometimes coupled with disrespect for physicians. When covering the trial of a

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mentioned below in the section on effects of the rabies coverage; see esp. the writings of John Harley Warner cited there. Accessible overviews may be found in Starr, *Social Transformation of American Medicine*; and, more recently, in W. F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge, 1994). While Bynum's emphasis is on Great Britain, his account integrates the changes taking place in France, Germany, and the United States as well and, unlike most such histories, does not neglect the public face of medicine or the credibility and status that scientific developments provided to the profession. His narrative also acknowledges the popular press at several points, especially in connection with Pasteur. Still useful is William G. Rothstein, *American Physicians in the Nineteenth Century: From Sects to Science* (Baltimore, Md., 1972).

<sup>9</sup> Many works provide entry into the visual record of nineteenth and twentieth-century medicine. I have examined the relation between style and content in a selection of illustrations in Bert Hansen, "The Image and Advocacy of Public Health in American Caricature and Cartoons from 1860 to 1900," *American Journal of Public Health* 87 (November 1997): 1798–1807. Among the most important studies of pictorial sources for medicine are Daniel M. Fox and Christopher Lawrence, *Photographic Medicine: Images and Power in Britain and America since 1840* (Westport, Conn., 1988); William H. Gerds, *The Art of Healing: Medicine and Science in American Art* (Birmingham, Ala., 1981); Janet Golden and Charles E. Rosenberg, *Pictures of Health: A Photographic History of Health Care in Philadelphia, 1860–1945* (Philadelphia, 1991); William H. Helfand, *Medicine and Pharmacy in American Political Prints (1765–1870)* (Madison, Wis., 1978); Helfand, et al., *The Picture of Health: Images of Medicine and Pharmacy from the William H. Helfand Collection* (Philadelphia, 1991); Helfand and Sergio Rocchietta, *Medicina e farmacia nella caricature politiche italiane, 1848–1914* (Milan, 1982); Chauncey D. Leake, "Medical Caricature in the United States," *Bulletin of the Society of Medical History of Chicago* 4 (April 1928): 1–29; Albert S. Lyons and R. Joseph Petrucelli II, *Medicine: An Illustrated History* (New York, 1978); Richard E. Weisberg, "The Representation of Doctors at Work in Salon Art of the Early Third Republic in France" (PhD dissertation, New York University, 1995); and Richard J. Wolfe, *Robert C. Hinckley and the Recreation of the First Operation under Ether* (Boston, 1993).

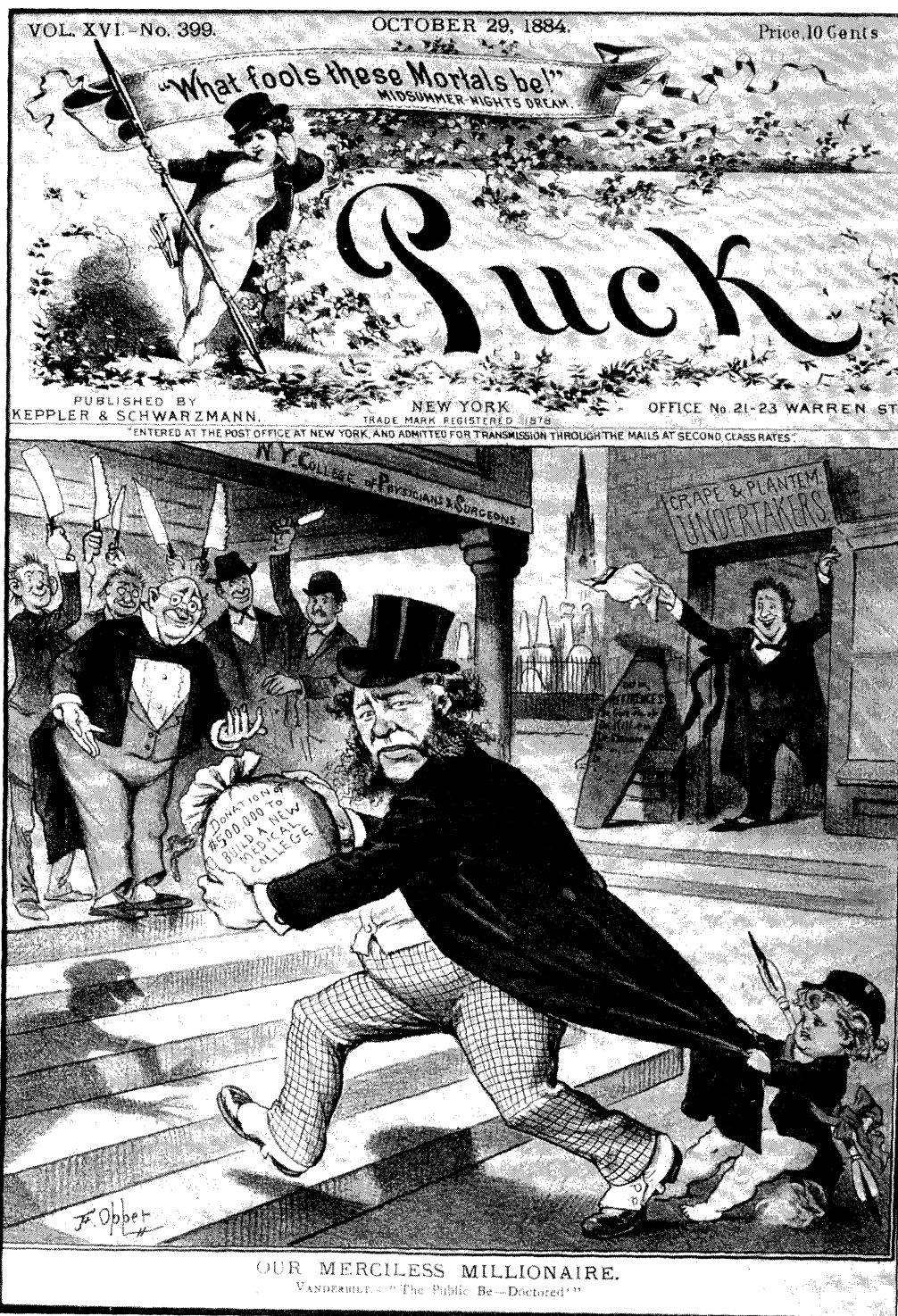


FIGURE 1: "Our Merciless Millionaire, Vanderbilt.—'The Public Be—Doctored!'" *Puck* (October 29, 1884), cover.

pharmacist for making a fatal error in preparing a remedy, for example, the *New York World* reported with no apparent sense of exaggeration: "There were so many doctors present that District Attorney Winfield said that all the patients in Hoboken would get well if the trial lasted a week."<sup>10</sup> Since prosecutor Winfield needed physicians as witnesses, he could not be expressing personal hostility but only joking about a common view of doctors. Similar skepticism about the benefits of a doctor's care appears in a cartoon entitled "A Wise Precaution," in which an old man is speaking with his wife at home. The man remarks, "I really must get my life insured; I am not feeling very well. I think I will call in on Dr. Gilbert and get some medicine, and to-morrow I will get insured." His wife replies, "Don't you think, Tommy dear, it would be safer to get insured first?"<sup>11</sup>

WHEN ENTHUSIASM FOR A NEW TRIUMPHANT MEDICINE did appear in the United States, it did not spring from Pasteur's pioneering 1882 achievement of a vaccine for anthrax, nor from Robert Koch's identification of the cholera bacillus that same year, nor from Koch's discovery of the tubercle bacillus in 1883—all major landmarks in scientific medicine.<sup>12</sup> Nor did it draw momentum from such earlier discoveries as inhalation anesthesia, introduced by American doctors and dentists of the late 1840s, or the antiseptic surgery developed and taught by Joseph Lister in the 1860s and 1870s. However much these advances appear momentous from our vantage point, they simply did not receive substantial treatment as news. The transformation in expectations came, rather, from Pasteur's triumph over a minor disease. Rabies was a malady that annually killed people by mere dozens, in contrast to such major killers as tuberculosis, pneumonia, smallpox, diphtheria, and infant diarrhea, which slew hundreds of thousands each year.<sup>13</sup> Hydrophobia in the

<sup>10</sup> *New York World* (January 5, 1886): 1, col. 7.

<sup>11</sup> *Puck* (September 2, 1885). Even by shifting one's gaze from magazine satire to fine art, an observer would not find in the United States an obvious portrayal of medical advance. Bracketing the Pasteur episode in time are the two most famous American paintings of physicians: *The Gross Clinic* of 1875 and *The Agnew Clinic* of 1889, large canvases of great emotional power by Thomas Eakins. Though different, the paintings each offer honor, praise, and status to a great physician. Yet these two doctors are surgeons, not scientists; they practice an old craft, however skillfully they do it. And since both pictures show an operation under way, the viewer cannot even know for sure that the surgery witnessed will be successful. A historically minded observer will note that in the later painting the medical operators are wearing white gowns (though no masks or gloves yet), unlike the street clothes of fourteen years earlier. But it would be wrong to see surgical hygiene as the point of this painting or as the achievement attributed to Dr. Agnew. I point this out not to fault Eakins for ignoring the scientific changes just under way in medicine but rather to confirm how uncommon was any expectation of medical breakthroughs, even for a man as perceptive and familiar with medicine as Eakins. See Elizabeth Johns, *Thomas Eakins: The Heroism of Modern Life* (Princeton, N.J., 1983); Linda Nochlin, *Realism: Style and Civilization* (Harmondsworth, 1971); and three papers in a symposium entitled "The Agnew Clinic: Medicine, Art, Literature in Late Nineteenth-Century Philadelphia," in *Prospects: An Annual of American Cultural Studies* 11 (1987): Margaret Supplee Smith, "The Agnew Clinic: 'Not Cheerful for Ladies to Look At,'" 161–83; Diana E. Long, "The Medical World of *The Agnew Clinic*: A World We Have Lost?" 185–98; and Patricia Hills, "Thomas Eakins's *Agnew Clinic* and John S. Sargent's *Four Doctors*: Sublimity, Decorum, and Professionalism," 217–30.

<sup>12</sup> The pattern was similar in Russia, where "it was not Koch's celebrated work on the anthrax bacillus, but Pasteur's anti-rabies vaccine that initially attracted Russian interest," according to John F. Hutchinson, "Tsarist Russia and the Bacteriological Revolution," *Journal of the History of Medicine and Allied Sciences* 40 (1985): 422.

<sup>13</sup> Consumption was the greatest single killer of the era, even though it was not feared as a

United States as in Europe and elsewhere—though well known and widely feared—was an infrequent illness.<sup>14</sup> It was, however, invariably fatal. And since there was no sure way to determine whether an animal that inflicted a bite was rabid or not, fear of a horrible death followed every dog bite for some weeks before one could assume the incubation time had safely passed. A small wound or its quick healing did not mean one was out of danger, as people learned from frequent stories in the press.<sup>15</sup>

In cities of that era, stray and feral dogs were remarkably numerous—if impossible to count. But an indication of the magnitude of the problem can be found in an official report in the 1880s tabulating the dead animals received at the docks for disposal; it records some 8,000 horses and 23,000 dogs in one twelve-month period (with countless others doubtless incinerated, buried, tossed in sewers, etc.).<sup>16</sup> Including both the strays and the dogs owned by families or businesses, one newspaper reported an estimate for New York City of 300,000 dogs, with another 150,000 in Brooklyn, and 150,000 in Newark and its suburbs. When a reporter presented these numbers to a local sportsman and dog-show judge, the expert found 300,000 for the city too high: “225,000 would be nearer the mark.” He also reduced the Brooklyn figure to 100,000, which still allowed the paper to claim that there were over half a million dogs within forty miles of New York City.<sup>17</sup> In most cities, controlling a large dog population was nearly impossible, even on occasions when

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contagious disease until some years after Koch's discovery. About one-seventh of all reported deaths were due to tuberculosis, and, among people who died in middle age, it claimed one in three. Thomas D. Brock, *Robert Koch: A Life in Medicine and Bacteriology* (Madison, Wis., 1988), 117.

<sup>14</sup> The terms “rabies” and “hydrophobia” may both be used for a single disease shared by animals and people. In older usage, hydrophobia was applied to the human malady and rabies to cases in animals. The symptoms that prompted the name hydrophobia are frequent but not always present in human cases, and are not characteristic of animal cases. It may be as an effect of Pasteur's introduction of an animal vaccine that “rabies” has generally replaced “hydrophobia” in most usages. In this article, the two words are used interchangeably except in quotations.

<sup>15</sup> The study of rabies in the United States has not benefited from the scholarly attention given to its history in Europe. A portion of the American medical profession's literature about the rabies cure has been examined very briefly in Leonard J. Hoenig, “Triumph and Controversy: Pasteur's Preventive Treatment of Rabies as Reported in *JAMA*,” *Archives of Neurology* 43 (April 1986): 397–99; more fully in Harkness, “Reception of Pasteur's Rabies Vaccine”; and in John D. Blaisdell, “With Certain Reservations: The American Veterinary Community's Reception of Pasteur's Work on Rabies,” *Agricultural History* 70 (Summer 1996): 503–24. See a succinct introduction to the nature of rabies and its history in France in Gerald L. Geison, *The Private Science of Louis Pasteur* (Princeton, N.J., 1995), 177–81; see also Jean Théodoridès, *Histoire de la rage: Cave canem* (Paris, 1986). On France and elsewhere, see the enormous compilation of articles running over 600 pages undertaken by the French Ministry of Agriculture's Informations Techniques des Services Veterinaires, *Pasteur et la rage* (Paris, 1985); the historical portion alone contains more than 300 pages. Two recent books on the cultural history of domestic animals in Europe each includes a chapter on rabies; for England, see Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, Mass., 1987); for France, Kathleen Kete, *The Beast in the Boudoir: Petkeeping in Nineteenth-Century Paris* (Berkeley, Calif., 1994). Kete's book is an expansion of her article “*La Rage* and the Bourgeoisie,” *Representations* 22 (Spring 1988): 89–107. See also John K. Walton, “Mad Dogs and Englishmen: The Conflict over Rabies in Late Victorian England,” *Journal of Social History* 13 (1979): 219–39.

<sup>16</sup> J. F. Smithcors, *The American Veterinary Profession: Its Background and Development* (Ames, Iowa, 1963), 402. At that time, New York City had over 1.25 million human inhabitants and about 10,000 horse stables.

<sup>17</sup> “Half A Million Dogs . . . Opinions of Experts . . . Useful Dogs and Useless Curs,” *New York Herald* (December 27, 1885): 5, cols. 3–6.

officials made the effort.<sup>18</sup> The sight of a policeman shooting at a dog was not uncommon, both on the street and in the pictorial press. In one full-page magazine engraving, a policeman aims his revolver at a saliva-drooling dog near a fashionably dressed lady trying to protect three small children. Behind the policeman is a crowd of men and boys hurling rocks and cans as they chase after the dog.<sup>19</sup> (See Figure 2.) No less drastic and hardly less visible was the official practice of drowning the impounded strays after a brief holding period. In a less squeamish era than ours, this procedure was graphically portrayed in the pictorial press.<sup>20</sup>

While cases of hydrophobia were numerically infrequent (seldom running to ten a year even in a large city), newspaper editors believed their readers to be interested in the fascinatingly gruesome details.<sup>21</sup> Representative of numerous similar articles is the following one, quoted in full to illustrate the brief but detailed

<sup>18</sup> The problem of hogs and dogs roaming the streets of New York attracted the attention of lawmakers from the colonial era onward. By the 1880s, hogs in Manhattan were largely under control, but dogs were not. John Duffy has described the situation: "In an effort to solve the perennial problem of strays, a law in 1867 prohibited all unmuzzled dogs from running at large in the street and established a bounty of 50 cents for each dog brought to the police dog pound. In previous years an open bounty had resulted in gangs of children brutally clubbing and maiming dogs. To prevent this disgraceful situation, only adults could collect the reward. Early in 1869, when several cases of rabies were reported, the Board of Health ordered the metropolitan police to shoot all suspicious looking dogs or any found in a sickly or emaciated condition." Duffy, *A History of Public Health in New York City, 1866-1966* (New York, 1974), 33-34. Duffy also noted that the ordinances provided for "the elimination of stray dogs during the early summer months. The enforcement of these laws was usually lax, but the appearance of a rabies case was enough to precipitate mass poisoning, shooting, or roundup of strays. For example, the threat of hydrophobia in 1872 caused the Health Department to begin a drive against strays" (p. 168).

<sup>19</sup> A similar illustration entitled "Shooting a Mad Dog" was published in *Harper's Weekly* (August 2, 1879); in it, a mustachioed policeman is firing his pistol at a very small dog. Again, as in the earlier Frank Leslie's depiction, startled bystanders are present, including a woman with a child and two boys who had been chasing this dog. Reprinted in John Grafton, *New York in the Nineteenth Century: 317 Engravings from Harper's Weekly and Other Contemporary Sources*, 2d edn. (New York, 1980), 161.

<sup>20</sup> See, for example, "Dog Days" drawn by S. G. McCutcheon in *Harper's Weekly* (August 7, 1880): 508, a full page of dog vignettes, including the lowering of a cage of dogs into the river to be drowned. In the midst of the Newark rabies furor, the *New York Daily Graphic* artist Louis Dalrymple offered a full page of scenes titled "Opening of the Dog Pound at the Foot of East Sixteenth Street," in which the largest, central image showed three men lowering a cage of dogs into the water (January 10, 1886). On occasion, political caricature included the same imagery. *Harper's Bazaar* (September 18, 1875): 616, ran a Thomas Nast-style cartoon of the dog pound ("Morituri [te] salutamus"), in which dogs being led to their death take leave of the poundkeeper's pet, sitting sadly by his house: "Caesar, we, who are about to die, salute you!" In 1881, Joseph Keppler drew for *Puck* (June 22, pp. 276-77), a large color centerfold caricature of national politics, "The Dog Round-Up We'd Like to See," incorporating not only the dog catcher (President Garfield) but the pens, the pound, and the heavy cage and derrick (operated by Uncle Sam under Columbia's direction) used to drown stray dogs in the river. A sign on the back wall reads: "All unfaithful politicians captured will be drowned here, without mercy."

<sup>21</sup> New York City, for example, experienced no hydrophobia deaths in 1885, and only thirty-nine over the preceding fifteen years. *New York Herald* (January 7, 1886): 6, col. 4. These were official figures of the registrar, made public upon a request from ex-governor Hoffman. In 1890, Hermann M. Biggs told the New York Academy of Medicine that New York City had reports of only nine rabies deaths over the prior ten years. "The Present Experimental Aspect of Pasteur's Prophylaxis for Rabies," *Transactions of the New York Academy of Medicine*, 2d ser., 7 (1890-91): 367. (While Biggs's figures include the post-vaccine years, the vaccine did not become readily available in New York City until the 1890s.) For Philadelphia, the numbers are comparable, with sixty deaths over the twenty-five years ending in 1884; see John G. Lee, "The Mortality from Rabies in the Last Twenty-Five Years in Philadelphia," *Medical Times* (April 3, 1886): 494-95. For Paris, Geison cites Pasteur's own figures showing an average of twelve deaths per year in the years preceding introduction of the new inoculation technique; *Private Science of Louis Pasteur*, 332-33.

# FRANK LESLIE'S ILLUSTRATED NEWSPAPER

No. 978—Vol. XXXVIII.]

NEW YORK, JUNE 27, 1874.

[Price, 10 CENTS. BEHOLDERS TO THE NEW YORK OFFICE.]



A SUMMER SCENE IN NEW YORK CITY.—A PERSECUTED DOG ON A LEADING AVENUE.—SEE PAGE 241.

FIGURE 2: "A Summer Scene in New York City.—A Persecuted Dog on a Leading Avenue," *Frank Leslie's Illustrated Newspaper* (June 27, 1874), cover.



narrative into which ordinary newspaper readers of the era could imaginatively place themselves (and their children).

DYING OF HYDROPHOBIA.  
TERRIBLE STRUGGLES OF A BOY WHO WAS BITTEN BY A VICIOUS DOG.

A vicious dog was shot in the area of the residence of Mr. F. Gilbert, No. 208 Fifth-avenue, on the 2d of April. Several boys had been attacked and bitten by the animal, which was a half-bred Newfoundland bitch, on the West Side of the City, whence it had been chased. One of the boys, Frederick Herrman Kruger, aged 11  $\frac{1}{2}$  years, died yesterday morning of hydrophobia, at No. 380 West Forty-second-street. On the day that he was bitten, he had just returned from the Fortieth-street public school, and was playing with another boy in front of his home when the animal came along from Eleventh avenue pursued by men and boys. It jumped at Frederick, threw him in the gutter, and tried to seize him by the throat. The boy held his chin down, and the brute caught him by the nose and nearly bit off the end of it. The animal then escaped, and was seen later in the day at Thirty-first-street and Tenth avenue. It was again chased and was killed by Officer Link, of the Twenty-ninth Precinct. Mrs. Kruger sent for Dr. Alfred W. Maynard, of No. 353 West Forty-second-street, who cauterized the wound and stitched the end of the nose in place. The injuries healed, leaving an ugly scar, and the incident was almost forgotten. On Saturday, Frederick, who had been playing in the street, went home and asked his mother for a drink of water. She gave him some in a glass from a hydrant in the yard, but when he attempted to raise it to his lips the muscles of his throat contracted spasmodically and his features became distorted. Handing the glass back to his mother, he said that he was ill and asked for water that was not cold. Mrs. Kruger gave him a glass of tepid water, but he was unable to swallow this and was seized with convulsions. Dr. Maynard at once detected unmistakable symptoms of hydrophobia. He administered hydrate of chloral and bromide of potassium until the convulsions were allayed, but they returned whenever water was offered to the patient. Up to Tuesday the boy's condition changed little, but in the afternoon of that day he imagined that dogs were under the bed trying to bite him, and that some one was in his room ready to shoot or cut him. He kept his hand over his nose as if to shield it, and screamed so loudly at times that he could be heard a block away. Violent convulsions set in during the evening and three persons were required to hold him. Large quantities of morphine were administered hypodermically every half-hour. In spite of this, the convulsions returned with increased force, and his cries, while they lasted, were agonizing. At 5:30 o'clock yesterday morning, when he died, his struggle was so great that three strong men, who were holding him down in bed, were exhausted. It is said that another boy who was bitten in the cheek by the same dog lives in the neighborhood.<sup>22</sup>

In this newspaper story, one is confronted not only with the pain of rabies but also the terror of facing such a death. Yet clinical features of this always fatal disease are not the only things that shape people's reactions to hydrophobia. Fascination with this disease seems to derive as well from its being so frequently caused by the animal known as "man's best friend." A dog bite leading to madness suddenly

<sup>22</sup> *New York Times* (June 9, 1881): 2. This article is typical in providing names, addresses, the biting encounter, the medical care, the healed wound, the helpless doctors, and the last agonies, including the ferocious, almost inhuman strength manifested by the victim near the end. In New York papers, one also finds numerous reports of rabies deaths from Milwaukee, Chicago, and several other cities and towns. One assumes that before these became national news items, they had first been reported in local papers.

reverses many aspects of the seemingly natural order of things, in ways that other illnesses do not. Rabies evokes treachery and betrayal; it is the sudden and total disruption of the dependable bond between people and domestic animals. Hydrophobia, unlike the epidemic killers such as plague, cholera, or yellow fever, was not seen as caused by someone foreign or something hostile and alien but by a member of the family and the neighborhood. Furthermore, rabies turns the world upside down in another way, for the dying patients not only lose their human reason but also exhibit physical strength that appears superhuman or, perhaps more accurately, subhuman.<sup>23</sup> Moreover, the laboratory research on rabies, like the police actions against stray dogs, could tap into profound emotional ambivalence about people's loyalty to animals, since this research required the medical sacrifice of seemingly innocent creatures, even though, like the wholesale drowning of strays by pound officials, the actions were deemed necessary to achieve public health and safety.

WITH A DEEP APPRECIATION FOR THE COMPLEXITY of such attitudes and the power of rabies' fear and fascination, Louis Pasteur proclaimed in October 1885 that such tragedies were henceforth preventable. For Pasteur, the rabies treatment was only one among his many remarkable successes in applied biology and chemistry, but it was the one that most fully captured public interest and support. Before the rabies vaccine, he was well known in France and among some groups of scientists elsewhere; afterward, his would be a household name and his rabies treatment efforts a focus for charitable efforts around the world.<sup>24</sup>

Because Pasteur's rabies research is well documented elsewhere, only a few general points need be rehearsed here.<sup>25</sup> Pasteur was hardly alone in seeking to identify the microbial causes of human diseases. The 1870s and 1880s saw a flurry

<sup>23</sup> An exploration of the cultural and psychological dimensions of the dual fear and fascination with rabies are beyond the reach of this article. Undoubtedly, the peculiar characteristics of the disease played a role in making it of interest to editors and readers. But discovering why people had this fascination (not only in America in the 1880s but in many other times and places) is not essential to understanding the character and extent of public attention to Pasteur's treatment of the Newark boys and appreciating the effects this coverage had on expectations of medical progress. There is a large anthropological literature on animals in human culture. Access to the far more limited historical writings for the late nineteenth century is found in the recent books by Kete and Ritvo cited above.

<sup>24</sup> Many wrongly assume that Pasteur became known to the general public in the United States from pasteurized milk. While Pasteur did develop heat treatments to improve the keeping quality of beverages two decades prior to the rabies vaccine, he applied them to beer and wine, not milk. As a means of improving the safety of milk, pasteurization achieved prominence in America well after the turn of the century; see S. Henry Ayers, *The Present Status of the Pasteurization of Milk* (United States Department of Agriculture Bulletin No. 342, rev. edn.) (Washington, D.C., 1922). For the introduction of milk pasteurization in Milwaukee, see Judith Walzer Leavitt, *The Healthiest City: Milwaukee and the Politics of Health Reform* (Madison, Wis., 1982), 180–87. For New York, see Norman Shaftel, "A History of the Purification of Milk in New York, or 'How Now, Brown Cow,'" *New York State Journal of Medicine* 58 (1958): 911–28. As late as 1916, a case was being made for the still-controversial technique by Charles Herbert Kilbourne, *The Pasteurization of Milk from the Practical Viewpoint* (New York, 1916). I am grateful to Gerald Oppenheimer for helping me locate a copy of Ayers's report.

<sup>25</sup> The following account depends on Geison, *Private Science of Louis Pasteur*; Gerald L. Geison, "Louis Pasteur," *Dictionary of Scientific Biography* (1974), 10: 350–416; Geison, "Pasteur, Roux, and Rabies: Scientific versus Clinical Mentalities," *Journal of the History of Medicine* 45 (1990): 341–65; and René Valléry-Radot, *The Life of Pasteur*, Mrs. R. L. Devonshire, trans. (Garden City, N.Y., 1924), 390–444.

of such work, largely stimulated by Pasteur's discoveries in fermentation and the complex of tentative theories and procedures that came to be called "the germ theory of disease." In addition to seeking the etiological agents, Pasteur and his collaborators pioneered experiments to attenuate or weaken an infectious agent so as to reduce its capacity for causing serious illness, while preserving its ability to provoke in an inoculated animal a natural protective response. This would then prevent the animal's subsequent infection by that same agent. Only one such protective sequence was known when Pasteur began his work, the prevention of smallpox in persons by inoculating them with smallpox matter or, more safely, with cowpox matter. (Since cowpox was also known as vaccinia, the process was called vaccination. After Pasteur's laboratory achieved successful prevention of chicken cholera and anthrax, he applied the word vaccination to this process in general, no longer restricting it to inoculation using cowpox.)

Several characteristics of rabies made it an attractive subject for research. It was a well-recognized specific disease, easily distinguishable from other ailments. It was transmitted by a known route of contagion (unlike tuberculosis, plague, typhus, yellow fever, and many other common diseases at that time). It had a determinable incubation period and a relatively long one. Pasteur's search for the causative microbe was unsuccessful, as was that of other researchers drawn to study this disease.<sup>26</sup> Investigators were drawn by rabies' characteristic fury and paralysis to the nervous system as a site of the unseen microbe, and Pasteur's laboratory developed clever techniques of transmitting the disease from one animal to another by removing pieces of the brain or spinal cord and applying them directly to the exposed brain of a new subject. Opening the skull (trephination) was a surgical technique dating to ancient times in both the Old World and the New. Pasteur's assistants did it well, carefully using the newly discovered anesthetics of his era to keep the dogs and rabbits asleep for the surgery.

By passing the undetectable rabies virus through several generations of experimental animals, Pasteur was able to achieve a highly virulent infective matter of standardized potency (as measured by the incubation time after a new animal was inoculated). Once he had produced infective matter of known potency, he could experiment with means of attenuating it. After trying a number of techniques he had used for other inoculations, he established to his satisfaction that air drying of infected marrow from a rabbit's spinal cord would reduce its potency from maximum to minimum in about fourteen days.

According to Pasteur's reports in the 1880s and the widely disseminated biography by his son-in-law, René Vallery-Radot, he was successful with a remarkably simple notion of how to create a natural resistance. Pasteur gave healthy dogs a series of inoculations with pieces of marrow that had been dried for

<sup>26</sup> We know today that the cause of rabies is a "filterable virus," that is, something so small it would have passed through the finest filters then available and too small to be separated or seen by any techniques of that era. In twentieth-century usage, we restrict the word "virus" to such particles. But in Pasteur's era, "virus" (whether in French or English) could be applied to any infectious agent, including the much larger (and quite different) bacteria and yeasts. To avoid confusion, historians usually avoid using the word virus in a nineteenth-century context except in quotations. Sometimes, when non-historians notice the word being used by Pasteur for the rabitic agent, they mistakenly give him credit for discovering its character as virus in the modern sense.

a decreasing numbers of days, ending up on the final day with highly virulent marrow that was known to kill an animal after a short incubation period. To some extent, this system seemed to Pasteur to work effectively in creating a refractory, or resistant, state in his experimental dogs.<sup>27</sup> He tested this state, his reports implied, by exposing treated dogs not only to virulent injections but also to natural rabies from bites by a rabid dog, and he announced a preventive vaccine for canine rabies in August 1884 at an international scientific congress at Copenhagen. During 1884, this work on canine rabies was the subject of an illustrated article in *Harper's Weekly* and a few very brief notices in the daily press.<sup>28</sup>

Given the long incubation period of natural cases of rabies, Pasteur wondered if it would be possible to start the process of artificially creating resistance *after* an animal (or person) had been bitten, with the hope that it might take hold before the "street infection" could do its lethal work. In the official and public accounts by his son-in-law and others, Pasteur worked in the winter of 1884–1885 on vaccinating dogs after they received rabid bites, and in March 1885 he began to consider the possibility of human trials, first on himself.<sup>29</sup> During the summer, fate intervened when Joseph Meister, a badly bitten nine-year-old boy from Alsace, and his mother arrived at Pasteur's laboratory (along with the dog's owner, who had also been bitten but less severely). The tense scene was described years later by Vallery-Radot: "Pasteur's emotion was great at the sight of the fourteen wounds of the little boy, who suffered so much that he could hardly walk. What should he do for this child? Could he risk the preventive treatment which had been constantly successful on his dogs? Pasteur was divided between his hopes and his scruples, painful in their acuteness." After consultations with physicians, Joseph was given, under Pasteur's

<sup>27</sup> Geison's brilliant work with Pasteur's laboratory notes shows that the route to success was neither short nor sure. At several points, important discrepancies exist between what had been achieved experimentally and what Pasteur either reported or led others to believe about his work. The actual achievements in his laboratory and some failures were not known, however, except to Pasteur and a very small number of associates until Geison's archaeology of the notebooks made them plain in recent years. For this reason, the emphasis of my narrative is on what was publicly known, reported, or believed in the 1880s about Pasteur's rabies work rather than Pasteur's now accessible "private" science. For the rabies research and its application to human patients, see Geison, *Private Science of Louis Pasteur*, chaps. 7–9.

<sup>28</sup> *Harper's* ran a full page of laboratory scenes, June 21, 1884: 392. The meager newspaper coverage during 1884 clustered in May, when Pasteur announced his success with dogs and a commission to certify his work was appointed, and in August when the commission's report became available. During May, three New York papers each ran one article (*New York Evening Post*, May 20, *New York Times*, May 21, and *New York Tribune*, May 23). On August 9, the *Times* ran a very brief notice (probably from a cable dispatch) on the commission making a public report. Later that month, the *Times* ran an article and an editorial on August 26 (the delay was perhaps to await receipt of the commission report by steamer). I have found no other notices of Pasteur's rabies work during 1884. But news of the disease, if not of its cure, continued to appear. For example, shortly after reporting on the commission's favorable report, the *Times* ran articles on August 29, 30, and September 1 about twenty Negroes in Alabama getting sick from eating a pig that had been bitten by a rabid dog. Neither scientific nor sympathetic, the stories mocked this tragedy. On October 5, the *Times* ran a typical news story about a young man, bitten by a large Spitz, whose uncauterized wound led to a violent and tortured death. The *New York Herald* published nothing at all on Pasteur's rabies work in 1884.

<sup>29</sup> In *Private Science of Louis Pasteur*, Geison has now shown that the first experimental inoculations ran from most virulent to least, rather than the reverse, and that Pasteur did not begin trying the least-to-most order until late May of 1885 (see chart on 244). Geison also identifies two prior trials on humans that were never acknowledged; the official accounts treat Joseph Meister's injections in July 1885 as the premier human experiment.

supervision, the first full human rabies treatment of twelve injections beginning on July 6, 1885, in a series of least to most virulent.<sup>30</sup>

Although Pasteur valued press coverage, often cooperating with reporters to the point of coopting them, he intentionally held back when it came to his first human experiment and allowed no press coverage for fear of the public's misinterpretation of any failure. Keeping awareness of this experiment within a small circle, Pasteur worried privately through July and much of August both that Joseph might die and that blame would fall on Pasteur's efforts, whether or not his inoculations were at fault. As August progressed and Joseph remained well, Pasteur regained his usual self-confidence but still made no public announcement. In mid-September, however, word of Joseph's survival (and possible cure) started to become public even prior to Pasteur's official report to the Académie des Sciences. The first news reports were favorable, if short, and anything but prominent. The discovery might well have passed quickly without making any impression on the public, especially across the Atlantic. In the ten weeks after the first report on September 20, the New York City papers ran only a few articles on the rabies treatment—all of them brief.

In mid-October, a second youth was brought to Pasteur for treatment. Jean Baptiste Jupille was fourteen years old, but this young shepherd was a hero, for he had turned to face the rabid dog that was chasing five younger boys and wrestled the dog to death while suffering severe bites on both hands. Pasteur confidently invited Jupille to Paris and began treatment about October 20. On October 26, Pasteur presented a triumphant account of the Joseph Meister treatment at the Académie des Sciences, ending with the story of young Jupille's heroism. Leaders of the academy, medical and scientific, praised Pasteur effusively and applauded the youth's bravery. The press reported at modest length on the address and the meaning of the achievement, but popular consciousness would need time and cultivation to be fermented first into curiosity and then into enthusiasm. Across the Atlantic, although reports were dutiful and encouraging, the rabies treatment made no front-page headlines. The brief and second-hand articles were based on letters, reports in scientific journals, or articles in the British press, and they lacked a strong human-interest angle. Through November, the articles resembled the brief items on other scientific and medical news in the 1870s and early 1880s, and most were shorter than the typical report about a death from hydrophobia or about cases of trichinosis after eating ham at a picnic.<sup>31</sup>

<sup>30</sup> Vallery-Radot, *Life of Pasteur*, 414. Interestingly, the dog experiments reported here as "constantly successful" have been shown by Geison's analysis to have been far, far less successful; only 62 percent (16 of 26) of the dogs receiving treatment after being bitten survived. *Private Science of Louis Pasteur*, table 9.1. This is only slightly better than the 57 percent survival rate of the seven untreated dogs held as controls.

<sup>31</sup> For the months preceding the Newark episode in December, I have reviewed only three daily papers systematically. Between September 20 and December 2, the *New York Tribune* printed just two articles (on October 28 and November 16); the *New York Herald* and *New York Times* had eight or nine apiece during this ten-week interval. While a few more items might be located, the pattern of limited interest without sensationalism stands in strong contrast to the deluge of attention after December 2. Post-Newark visuals are discussed below; prior to the Newark episode, the only rabies visuals in the American press during 1885 were in the *New York Daily Graphic*, which on November 19, 1885, showed Pasteur watching the injection of Jupille (apparently copied from a French magazine, *L'illustration*, of November 7, 1885) and then on December 1 published two images of Pasteur in his laboratory (both taken from the *London Graphic* of November 21).

EVERYTHING CHANGED RADICALLY IN EARLY DECEMBER. On December 4, a cluster of several interlocking stories appeared in long articles in most New York City and Newark papers. The *New York Herald* ran this stack of headlines:

IN TERROR OF HYDROPHOBIA.  
SIX CHILDREN IN NEWARK BITTEN BY A DOG SUPPOSED TO BE MAD.  
PASTEUR LOOKED TO FOR AID.  
AN ATTEMPT TO BE MADE TO SEND THE VICTIMS TO PARIS FOR TREATMENT.

Four of the six bitten children were judged by local physicians to be hurt seriously enough to need the trip: Eddie Ryan (age five), Patrick Joseph Reynolds (age seven), Austin Fitzgerald (age ten), and Willie Lane, a messenger boy (age thirteen).<sup>32</sup> On December 8, the *New York Sun* ran the first pictures of the four new celebrities. On December 9, the *New York World* added a picture of Dr. O'Gorman, who had alerted the public to this new French cure and coordinated the collection of funds.<sup>33</sup> The same day, the *New York Times* took the opportunity to acknowledge the news of a girl in Pasteur's care who had died after being inoculated, but it carefully reported Pasteur's explanation that "the period of incubation had expired and the treatment was therefore too late." The paper also quoted the chemist's firm assurance: "I am confident my treatment will be successful if commenced at any time before actual hydrophobia sets in, even if a year or more elapses between the bite and the commencement of treatment."<sup>34</sup>

All the December 9 articles reported on the boys and their families taking a ferry from Newark to New York and boarding the steamer, which was to embark the next morning for Le Havre. The *World* on December 10 carried pictures of them going aboard and of the room fitted out as their "hospital," as well as a portrait of Pasteur and of a Dr. Frank Billings, who was to accompany them and introduce them to Pasteur's laboratory, where, it was said, he had studied. In charge of the traveling party was Eddie Ryan's mother (eight months pregnant), who brought along her youngest son Willie, not bitten but too young to be left home without her. For the week the boys were at sea, there could be no news of them, so the papers kept the theme alive with more stories about the dog pound and the control of stray dogs, about a new rabies victim (with articles showing pictures not only of a Charles Kaufmann, who had been bitten, but also of the dogs involved), about Pasteur's earlier work, and even about the history of applied science in France more generally.

<sup>32</sup> Similar stories ran in all the New York and Newark papers, and they were picked up widely across the country. My citing or quoting from any particular newspaper at any point should not be taken to imply that this paper is the only source on the matter or that the matter appeared only in local newspapers. I am grateful to a number of my students whose efforts at searching newspapers for stories about rabies and other medical breakthroughs have contributed to this research, beginning with Thomas Mofte (now M.D.), an undergraduate at SUNY Binghamton in 1977, and continuing with Ersi Demetriadou, Theresa Pagliuca, M.D., and John Rescigno, M.D. Other students' research papers are cited below.

<sup>33</sup> Some of the images printed in the *New York World* on Wednesday, December 9, were apparently copied from those in the *New York Sun* on Tuesday, December 8. This led to an extensive exchange of comments, not only in the two papers involved but in the *New York Evening Post* as well (December 10, 1885): 2, col. 1.

<sup>34</sup> *New York Times* (December 9, 1885): 4, col. 6.

In the week or so since the Newark boys had been bitten, readers in the New York area—and throughout America, since the stories were widely reprinted in the papers of large and small cities all across the country—had been treated to such extensive coverage (including editorials, letters to the editor, and comments by one paper about another's reporting or illustrations) that the enthusiasm became a target for satire. On December 16, *Puck* ran a cartoon entitled "The New Scheme," showing two hoboos in conversation. The first proclaims, "Congratulate me, old man—I'm going to Paris." The second inquires, "How'd yer work it?" The first explains, "Said I was bitten by a mad dog—pop'lar subscription gettin' up to send me to Pastoor."<sup>35</sup>

December 19 was the cover date for at least three magazines that ran illustrated versions of the story: *Frank Leslie's Illustrated Newspaper*, *Harper's Weekly*, and *Scientific American*. The *Frank Leslie's* article opened with a prescient forecast, calling this "an international episode of peculiar interest . . . which will occupy public attention in both France and America for some weeks to come."<sup>36</sup> (While the French did not sustain a continuous fervor about *les quatre petits Américains*, the Americans would do so with a vengeance.) The "news sketches" in these magazines

<sup>35</sup> *Puck* (December 16, 1885): 243. But in addition to jokes like this, which made fun of the popular enthusiasm, there also appeared caricatures like the *Puck* cover for December 16, 1885, "Another Patient for Pasteur: Let Him Be Taken to Paris and Treated for Blainiac Rabies" (p. 241), in which the intent was political satire and the Paris rabies-cure sensation simply a vehicle for other messages. (The reference is to James G. Blaine, Cleveland's unsuccessful opponent in the 1884 presidential campaign and a politician infamous for several scandalous indiscretions.) The image illustrated an assumption by cartoonist and editor that most readers will already be quite familiar with the new Parisian treatment. As an issue with a cover date of December 16 was actually printed and circulated as much as seven days earlier, popular enthusiasm for the boys' trip was mushrooming in just a very few days. *Puck's* back cover cartoon of the following week, "The Pasteur Boom: High Times for Hydrophobists; Now Is the Time to Get Bitten by a Rabid Dog and Take a Trip to Paris," first satirized the Pasteur mania, then entered the story itself when, two weeks later, this magazine reached Europe by steamer, and the *Herald's* Paris correspondent had the pleasure of showing it to Pasteur himself on the morning of January 7. The great chemist enjoyed the joke, and his remarks were immediately cabled across the Atlantic for Americans to read the next morning in the *Herald* (January 8, 1886): 5, col. 1.

<sup>36</sup> Pasteur watching the injection of Jupille was the graphic centerpiece of the stories in this issue of *Harper's Weekly* (p. 836) and *Scientific American* (p. 391, crediting the *New York Herald* as the source for its story). *Frank Leslie's Illustrated Newspaper*, "M. Pasteur and His Patients," p. 4, had four small drawings of the Newark boys (based, it seems, on those published in the *World* and/or the *Sun*) along with a large, uncredited reproduction of an engraving showing the scientist at work, "The French chemist, M. Pasteur, experimenting on a chloroformed rabbit," p. 300. Pasteur and another assistant face the viewer across a bench on which another assistant, back to the viewer, is drilling an opening in the skull of a rabbit stretched out on a slab. Although this latter image might well have first appeared in 1884 in reports on the dog experiments, prior to the human treatments, I have not been able to find earlier printings than those in the *London Graphic* of November 21, 1885: 561 and the *New York Daily Graphic* of December 1: 205. According to the *Daily Graphic*, December 6, their image had already been copied by the *Telegram*.

Two other "action shots" of Pasteur circulated in the popular media of France, England, and the United States: Pasteur standing between two rows of rabbit cages (*L'illustration*, May 31, 1884; *Harper's Weekly*, June 21, 1884; *La science illustré*, September 15, 1888) and Pasteur peering through a microscope (*London Graphic*, November 21, 1885; *New York Daily Graphic*, December 1, 1885; *L'univers illustré*, December 12, 1885). The famous Albert Edelfelt painting of Pasteur contemplating a drying jar that holds a rabbit spinal cord infused with infective rabies material was first publicly exhibited at the Paris Salon in May and June 1886, after which it was widely reproduced even in the United States, for instance on the cover of *Once a Week: An Illustrated Weekly Newspaper* (Collier's), October 7, 1890; in *Frank Leslie's*, January 12, 1893 (after Pasteur's seventieth birthday); and with the obituary in *Harper's Weekly*, October 12, 1895. For a full account of the Edelfelt work and its influence on French painting more generally, see Weisberg, "Representation of Doctors at Work in Salon Art," chap. 5.

were becoming routine, unlike the originality shown the same day by the *New York Daily Graphic*, which covered its whole front page with nine drawings and cartoons about dogs, rabies, and the fashion of seeking cures in Paris—all surrounding the powerful image of a revolver aimed at a cowering dog. One of the cartoons, showing a young girl in a drug store, predicted vaccines as a commonplace of the future; her request to the clerk behind the counter was “Fifteen Cents Worth of Hydrophobia Virus, Please, for Pa.” (See Figure 3.)

By December 21, the boys had arrived in France, and the transatlantic telegraph cable could convey dispatches back to New York in about six hours, with reports daily and sometimes even more frequently. The next day, the *New York Times* carried these headlines on the front page:

IN PASTEUR'S LABORATORY.  
THE NEWARK CHILDREN INOCULATED LAST EVENING.  
THEY REACH PARIS ALL RIGHT, UNDERGO THE OPERATION BRAVELY,  
AND THEN GO TO BED AND TO SLEEP.  
BY COMMERCIAL CABLE FROM OUR OWN CORRESPONDENT.

The *Herald* was more dramatic with two huge articles, each opened by a high stack of headlines. Local news was mostly tragic:

DOGS MAKING HAVOC.  
TWO MEN, A LAD AND A GIRL TORN BY RABID BRUTES IN JERSEY.  
THE END OF A DAY'S HUNTING.  
ALARM AT MATTAWAN, KEYPORT, ORANGE, AND ENGLEWOOD.  
FIDO ATTACKS HIS LITTLE MISTRESS.  
FORTY DOGS KILLED AND A GREAT SUNDAY DOG HUNT.

News from abroad ran the gamut:

PASTEUR'S PATIENTS.  
ARRIVAL OF THE NEWARK CHILDREN IN PARIS.  
INCIDENTS ON THE JOURNEY.  
PATSEY REYNOLDS ATTEMPTS TO THROW HIMSELF OVERBOARD.  
THE BOYS INOCULATED.  
SURPRISED TO FIND THE OPERATION DOES NOT HURT.  
HORRIBLE DEATH IN THE LABORATORY.

With exaggerated precision and mock seriousness, a cable dispatch from the *New York Herald's* correspondent captured the historic moment:

Dr. [Grancher], who performs all the inoculations for M. Pasteur, told Lane to unbutton his jacket. At exactly twelve minutes before seven the Doctor inserted the point of a silver needle beneath the skin of Lane's abdomen and injected the virus. Lane has thus the honor of being the first American ever inoculated for rabies. As the needle was withdrawn he gave a slight squirm and burst into a boisterous laugh, explaining, “Why, it's like the bite of a big mosquito. It doesn't hurt a bit.” Fitzgerald's turn came next. He watched the silver needle intently, and when pricked said, “How it tickles.” Patsey Reynolds was next taken in hand. His stomach was bared, and when pricked he cried out, “Golly! Is that all we've come so far





for?" . . . The children then scampered off as cheerful as jay birds and not a bit homesick. The inoculations took place in the same room of the laboratory where a man on Saturday died of rabies.<sup>37</sup>

As the New Year opened, new players entered the drama. Two cities simultaneously announced the incorporation of institutions to prepare rabies vaccine and offer American victims of dog bites quicker access to the new lifesaving technique. The *Times* reported on January 1: "A Virus Farm Established and Stocked in St. Louis." On the third of the month, the paper reported a similar group in New York City, where something called "the American Pasteur Institute" was incorporated by eight eminent physicians. These efforts preceded Pasteur's own call for such an institute by over two months, and they were not sanctioned by the great chemist. The preliminary (not to say premature and presumptuous) character of these ventures is indicated by the fact that Pasteur had not yet published a full scientific report of his methods, although the general account of the Joseph Meister case, which he read at the Academy of Sciences of Paris on October 26, had been printed in French in *Comptes rendus hebdomadaires des séances de l'Académie des sciences* and would be published in English in January 1886 by the *Popular Science Monthly*. In addition to these charitable efforts, an American with commercial intentions had approached Pasteur, much to his chagrin, with a proposal for a commercial vaccine enterprise, even offering Pasteur two-thirds of the profits. Not surprisingly, Pasteur rejected the offer with a sneer about America's famed commercialism, and he told the *Herald's* Paris correspondent: "Your countrymen go too fast."<sup>38</sup>

When American physicians attempted to replicate Pasteur's miracle-making experiments, their imitation was sincere, if clumsy. But because their laboratory efforts had substantial visibility in the daily press, even more people became familiar with this new and hitherto alien enterprise. The *New York Daily Graphic* ran large illustrations on January 3 of local Newark physicians—whom it labeled "scientists"—dissecting rabbits that had been inoculated with nerve tissue from the dog that was killed after ravaging the children on December 2. (See Figure 4.)

On the same day, the press announced the children's departure from Paris and their fond farewell from Pasteur's care. Even before the boys had arrived back in New York harbor, American commercialism saw profits to be made from the new folk heroes. A very popular wax museum, the Eden Musée, defined the boys a week later as a new sensation, advertising "The Topic of the Day, M. Pasteur Operating on One of the Newark Children."<sup>39</sup> This entertainment venue, which had opened in

<sup>37</sup> *New York Times* (December 22, 1885): 1; *New York Herald* (December 22, 1885): 2, cols. 3 and 1; extracted quote, p. 2, col. 1.

<sup>38</sup> *New York Times* (January 1, 1886): 14, col. 2; (January 3, 1886): 4, col. 7; *New York Herald* (January 8, 1886): 5, col. 1. The *Herald's* report plays on then-common images of Americans as fundamentally entrepreneurial, risk-taking, and unfettered by a (sensible European) respect for tradition. It is also noteworthy that Pasteur understood the importance of staying distant from commercial exploitation of his discoveries (while still finding ways to receive financial benefits).

<sup>39</sup> *New York Tribune* (January 9, 1886): 7, col. 6. This is the earliest ad I have found that mentions the Pasteur inoculation group; it was also advertised in the *Daily Graphic* as late as January 29, 1886: 607, col. 4. The Eden Musée ran a general ad every week in *Life* magazine, but its copy did not change over the five weeks that I observed in January and early February 1886, and the ads mentioned nothing about Pasteur or the Newark children, even though *Life* regularly carried cartoons, stories, and jokes

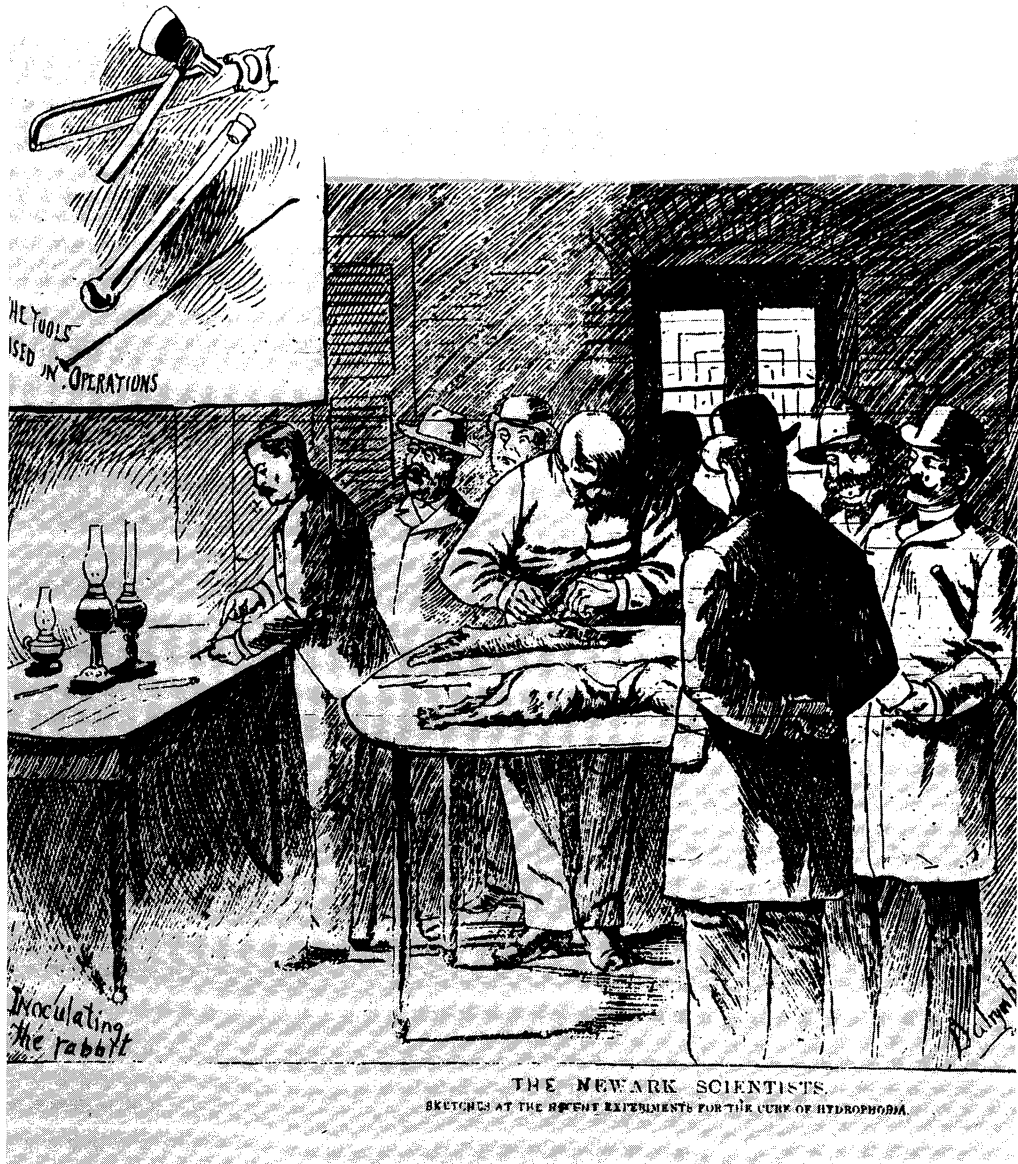


FIGURE 4: "The Newark Scientists, Sketches at the Recent Experiments for the Cure of Hydrophobia," *New York Daily Graphic* (January 3, 1886): 4.

1883 in an elaborate building on 23rd Street just west of Fifth, "drew a largely conservative middle-class audience," presenting musical performances as well as the wax-figured exhibits.<sup>40</sup>

about the Pasteur mania beginning with its January 1, 1886, issue and continuing at least through February 4. I have not located any pictorial material from the Eden Musée showing what the Pasteur exhibit looked like; it seems possible, however, that the exhibit's appearance is fairly represented in the political caricature shown below in Figure 6 below.

<sup>40</sup> Don B. Wilmet, *Variety, Entertainment, and Outdoor Amusements: A Reference Guide* (Westport, Conn., 1982), 94.

But even more elaborate ways to satisfy the public's curiosity about the new miracles of medicine were available. Dime museums, clustered along the Bowery, provided entertainment to lower-middle and working-class visitors with as many as twenty shows a day. More sensationalist than P. T. Barnum's American Museum or the Eden Musée, these smaller establishments, often in storefronts, charged the low admission price conveyed by their name. The 1880s were their heyday, though many survived well into the twentieth century. A contemporary observer, the city missionary and philanthropist Mrs. Helen Campbell, has provided a revealing, if not entirely sympathetic, description of the venues in which Pasteur's boys would appear.

Above and on each side of the doors of these museums are large and gaudy paintings on which the wonders . . . within are elaborately presented, and the chief wonder is oftentimes the liberality of the outside display compared with the paucity within . . . The museum owner, always a handsome man with a fierce mustache and large diamonds, stands near the door, and close to him a second-rate dwarf, dressed as a policeman, club in hand, shouts out directions about keeping order. A mermaid stuffed and dried, swings from a nail on the wall . . . The first object that greets you inside is usually the tattooed man . . . Next to the tattooed man is the lecturer, a very important being, who explains and dilates upon the attractions of the collection, and who passes with the grace of a Chesterfield from the charms of the fat woman to the rare qualities of the man who eats glass.<sup>41</sup>

The idea of putting the little Newark boys themselves on exhibit appeared on the front page of the *Newark Daily Journal* on January 13, just before they were scheduled to return. In a report about the parents' anxious wait for the steamer's arrival came word of the possibility. "The proprietor of a Bowery dime museum has been working assiduously for several days to secure the children for two weeks to place on exhibition. He offered the parents \$15 a week. It is not likely that the proposition will be accepted." The boys' working-class families eventually acceded to the proposition, although they acted with ambivalence and embarrassment, facing condemnation from some middle-class newspapers and an investigation threatened by the New York Society for the Prevention of Cruelty to Children.<sup>42</sup> But this was, after all, a very attractive offer, given that \$12 to \$15 a week were the wages of a skilled workman (though very popular freaks could command fees as high as \$200 a week).<sup>43</sup>

A lengthy article in the *Newark Daily Advertiser* on January 19 reveals the complexity of the parents' situation, especially compared to the boys' simple delight in their adventure: "Contrary to the general expectation of the public, and also

<sup>41</sup> Helen Campbell, *Darkness and Daylight: Lights and Shadows of New York Life* (Hartford, Conn., 1895), 466–68. On the history of dime museums, see esp. Andrea Stulman Dennett, *Weird and Wonderful: The Dime Museum in America* (New York, 1997). Still useful are Brooks McNamara, "'A Congress of Wonders': The Rise and Fall of the Dime Museum," *ESQ: A Journal of the American Renaissance* 20, no. 3 (1974): 216–32; and David Nasaw, *Going Out: The Rise and Fall of Public Amusements* (New York, 1993), chap. 2. Neil Harris's sophisticated study of Barnum and his milieu provides a far more extensive appreciation of the place of popular amusement in this era than its title suggests; see Harris, *Humbug: The Art of P. T. Barnum* (Boston, 1973). A drawing of the entrance to a dime museum, very much like Campbell's description, appeared in *Harper's Weekly*, February 26, 1881; reprinted in Dennett, in Nasaw, and in Grafton, *New York in the Nineteenth Century*, 136.

<sup>42</sup> *Newark Daily Journal* (January 13, 1886): 1, col. 1; and (January 20, 1886): 1, col. 1.

<sup>43</sup> McNamara, "Congress of Wonders," 224, offers these wage figures.

contrary to the expressed intention of the parents of the boys, three of the bitten boys are now inmates of the Globe Museum in New York.”

An *Advertiser* reporter called at the house of Austin Fitzgerald’s parents, No. 51 Union street, this morning, and saw Mrs. Fitzgerald. She said it was true that Austin was in the museum, and that she believed he would stay there about two weeks. She said that others had been after him also. Willie Lane’s parents could not be found and the house was shut up. Patsy Reynolds’s father said, “Yes, the boy is gone. His mother consented, and as long as she was willing, I could not help it. I did not object, as long as the other boys were going. If he had been going alone, I would object. His mother told me he was to get \$20 a week.” A man in the place spoke up and said: “It’s \$20 a week they all get and \$2.50 for their board.”<sup>44</sup>

At this point, the article continues with a long extract from another newspaper’s story on the exhibit and its audience, crediting the following paragraphs to the *New York Sun*.

Three of the dog-bitten Newark children, little “Patsy” Reynolds, Austin Fitzgerald, and Willie Lane, were yesterday placed on exhibition at the Globe Museum in the Bowery. They were perched upon a pedestal, with the champion fat woman on one side and a white silk-haired man on the other. Crowds came to see them all day, and at night the museum was packed so full that the spectators could hardly get out.

Prof. Hickey gave the sightseers a complete history of the children from the time they were bitten by the dogs until they were brought to the city for exhibition. He also gave a scientific explanation of Pasteur’s method of treatment, and said that hereafter the boys might be bitten by any number of dogs and that it would have no dangerous effects.

Little Patsy enjoys museum life immensely, and between the acts amused himself by poking fun at “Broncho” John and his bear. Later he teased the monkeys and tried to jab the wild man with the pin he used so successfully on the steamer’s cook. In the course of the afternoon he became uneasy and punched Austin Fitzgerald, one of his colleagues, because he claimed to have taken part in the French cook affair. He held animated conversations with grown folks, but would not deign to speak to the small boys. He was evidently more of a hero in their eyes than “Broncho” John himself. He honored one party of children by shooting orange seeds at them, and an old lady carefully gathered these up to preserve as relics. Patsy’s particular friend at the museum is Captain Jack Husey, the heroic swimmer who has saved the lives of so many human beings, not to mention horses.

The managers of the museum had the audacity to ask Dr. Billings to exhibit with the children, and made a similar proposition to M. Pasteur.<sup>45</sup>

When the *World* reported on this exhibit a week later on January 27, the point of its story was not the proceedings themselves but their magnitude. “Three of the Newark boys draw crowds to a Bowery show-house . . . Three hundred thousand

<sup>44</sup> *Newark Daily Advertiser* (January 19, 1886): 2, cols. 2–3. Among the works cited in the above notes, only Dennett mentions the Globe dime museum, where the boys were exhibited in New York.

<sup>45</sup> *Newark Daily Advertiser* (January 19, 1886): 2, col. 3. The remainder of the article was not from the *Sun*; it concerned the veterinary surgeon Sattler, who had been bitten by a dog in Orange, New Jersey, and went to Paris. He had been accused by some newspapers of being an “adventurer,” going only to look around and not being in need of treatment. His letter, quoted at length, included this observation, “In this part of the world people have not such a dread of hydrophobia as they have in America, and are not so enthusiastic over the experiments of the savant.” His next communication, however, indicated he was to receive twelve inoculations and return to the United States in late February.

persons have paid 10 cents apiece to get a look at them, and their popularity is increasing daily." Twenty times a day, the trio stood on stage. The managers had plans to exhibit them "in all the large Eastern cities."<sup>46</sup> Now, 300,000 persons would represent over 20 percent of New York City's inhabitants at the time. But it is possible, if perhaps not likely, that the figure is not excessively exaggerated, as one historian has reported that attendance at a dime museum could sometimes run as high as 10,000 people each day.<sup>47</sup> Although for much of the New York run, only three boys were on exhibit due to the absence of five-year-old Eddie, the *Newark Daily Advertiser* reported on January 29 that Eddie was due in the New York show "next Monday," shortly before the group's expected move to Philadelphia. A flier heralds that visit: "Palace Museum . . . One Week Only . . . The Newark Children . . . Pasteur's Patients from Paris! Whom we have induced to exhibit, for one week only, at the Enormous Salary of One Thousand Dollars."<sup>48</sup> (See Figure 5.)

Whatever the attendance figures and however many the cities where they appeared, the above reports demonstrate that a large share of the American public experienced a direct and personal engagement with Pasteur's miracle cure. The boys who received their shots in Paris became folk heroes—at least for a moment—achieving a momentary celebrity rather like that accorded some recipients of more recent medical miracles. Several examples of publicly identified patients come to mind: Dr. Christiaan Barnard's first heart-transplant patient, Louis Washkansky, in 1967; Louise Brown, born in 1978 as the first "test-tube baby" conceived by in-vitro fertilization; Seattle dentist Barney Clark, who lived 112 days with the Jarvik-7 artificial heart in 1982–1983; and William Schroeder, America's second recipient of an artificial heart, who lived on it for 601 days, starting in November 1984, with media attention that included a live press briefing on the new cable-TV channel CNN and a telephone call from President Ronald Reagan, whom Schroeder asked to locate an overdue Social Security check.<sup>49</sup> Most recently, the national press ran front-page stories about Jeff Getty, the AIDS patient who

<sup>46</sup> *New York World* (January 27, 1886): 6, col. 4. *The New York Clipper*, the trade paper of the entertainment world, was more laconic, simply reporting, "At the Globe Dime Museum, 298 Bowery, this week's curios are Capt. John Hussey, the aquatic hero; Broncho Johnny, scout; Professor King and the Pasteur patients from Paris—the Newark boys, as announced. Stage people—P. F. Doody, Delia Stevens, Whipler Twins and Ed. Atkins. Next week, Chas. F. Seabert in 'The Old Cabin Home'" (January 23, 1886): 710. In the *Newark Daily Advertiser*, quoting the *Sun*, the professor's name was reported as Hickey (January 19, 1886): 2, col. 3.

<sup>47</sup> McNamara, "Congress of Wonders," 224.

<sup>48</sup> *Newark Daily Advertiser* (January 29, 1886): 2, col. 5. A copy of the handbill that announced the boys' appearance in Philadelphia was graciously sent to me by Mme. Annick Perrot, conservator of the Musée Pasteur in Paris. The Palace Museum is not listed among the twelve Philadelphia dime museums in Dennett, *Weird and Wonderful*, 153. Documentation to confirm showings in other American cities has not been located, but the boys may have traveled to several in the four weeks between their February 14 opening in Philadelphia and their return to Newark in mid-March; indeed, the *Newark Sunday Call* announced that they had returned home from "dime museums in various parts of the country" (March 14, 1886): 8, col. 2.

<sup>49</sup> Among studies of medical change, Renee C. Fox and Judith P. Swazey, *Spare Parts: Organ Replacement in American Society* (New York, 1992), is unusual in making media coverage an integral part of the narrative and analysis. Patients recognized by the public were sometimes important even when the coverage was negative. For example, a dramatic cover photograph on *Life* magazine, September 17, 1971, used the public's familiarity to set up a disturbing exposé: "A New Report on an Era of Medical Failure—The Tragic Record of Heart Transplants—Six recipients of transplants, shown here against a picture of the heart, were all dead within eight months of being photographed together."

# BROADWAY & TREYSEY'S PALACE MUSEUM

North Sixth Street, near Franklin Ave.

**JAMES A. BARNES, - - SOLE MANAGER**

*Everything New! Everything Good! Everything as Represented!*

**POSITIVELY the GREATEST SHOW on EARTH**

**10c.** ONE LITTLE DIME **ADMITTS TO MUSEUM, MENAGERIE AND THEATRE. 10c.**

**SPECIAL NOTICE!**

ONE WEEK ONLY, Commencing

**Sunday Afternoon, FEB. 14**

## The Newark Children

Viz: Little Patsy Ryan, Willie Lane & Austin Fitzgerald

## PASTEUR'S PATIENTS

**FROM PARIS!**

Whom we have induced to exhibit, for one week only, at the enormous salary of

**\$1000**

### THE NEWARK BOYS



**One Thousand Dollars**

The NEWARK BOYS have returned from Paris in perfect health, after a most successful treatment of that dread disease.

### HYDROPHOBIA

By the great Scientist,  
**PROF. PASTEUR**

and they will positively appear in the extensive Curio Hall of this Museum Daily.

A highly instructive and interesting lecture will be given hourly illustrating the methods by inoculation of this wonderful cure.

FIGURE 5: Handbill promoting the appearance of the Newark boys in a Philadelphia dime museum, circa 1886. Courtesy of the Musée Pasteur, Paris.

received a transplant of bone marrow from a baboon in December 1995 in San Francisco. And however strange it may seem to us to have patients up on a theater stage, the Newark boys' experience was not unique. It was, nonetheless, rather unusual; only three other examples of patients on public display in entertainment venues have come to my attention. As exhibitable medical marvels, Alexis St. Martin and Phineas Gage were exhibited around the country on several occasions in the 1850s, and the incubator babies of Dr. Martin A. Couney were a spectacle for a paying public at Coney Island for much of the first half of the twentieth century.<sup>50</sup> The showman's role in pulling in an audience to pay for expensive medical care did have an essential analogue in the 1880s, although it was neither Pasteur nor the opportunistic freak-show managers who hired the Newark boys. The key fundraisers were the self-serving editors of the *Herald*, the *World*, and the other newspapers, those enterprising men whose articles promoted the enthusiasm and attracted the money to carry the Newark boys to Paris in the first place.

One caricature from late February 1886 documents in concise form just how completely the public consciousness had been saturated with Pasteur's achievement. It is an elaborate cartoon from *Judge*, a magazine of political satire, where

<sup>50</sup> In 1833, army surgeon William Beaumont published *Experiments and Observations on the Gastric Juice and the Physiology of Digestion*, through which he became famous as a physiologist here and in Europe for the experiments he performed on Alexis St. Martin, a patient whose stomach (owing to the way a gunshot wound healed to form a gastric fistula) had a direct opening to the outside. Among other feats, Dr. Beaumont could draw out gastric juice for in-vitro examination, and he could put pieces of food on a string directly into St. Martin's stomach and retrieve it for information on the process of digestion. Beaumont exhibited his experimental subject only to medical meetings. Some years after Beaumont's death, an impoverished St. Martin consented to be taken on a freak-show circuit by Dr. Bunting, a huckster who presented himself as a physician. Sometimes the shows were reported in the local press and in medical journals, but there was no general media fervor or any widespread awareness of either St. Martin or Dr. Beaumont by the public at large. In fact, the exhibition episode has been largely overlooked even by Beaumont scholars. See Edward H. Bensley, "Alexis St. Martin and Dr. Bunting," *Bulletin of the History of Medicine* 44 (1970): 101–08. On the scientific context, see Ronald L. Numbers and William G. Orr, Jr., "William Beaumont's Reception at Home and Abroad," *Isis* 72 (1981): 590–612; Edward C. Atwater, "'Squeezing Mother Nature': Experimental Physiology in the United States before 1870," *Bulletin of the History of Medicine* 52 (1978): 313–35; and Ronald L. Numbers, "William Beaumont and the Ethics of Human Experimentation," *Journal of the History of Biology* 12 (Spring 1979): 113–35.

Phineas Gage, who survived for twelve years (with a changed personality) after an iron rod was accidentally driven through his skull in 1848, was exhibited at medical meetings and, possibly, under the auspices of P. T. Barnum. His skull and the bar are permanently displayed in a medical museum. See John M. Harlow, "Recovery from the Passage of an Iron Bar through the Head," *Publications of the Massachusetts Medical Society* 2, no. 3 (1868): 329–47; Ambrose L. Ranney, "The Brain of Man, Its Architecture and Requirements," *Harper's New Monthly Magazine* 70 (March 1885): 632–41; and Joan Burbick, *Healing the Republic: The Language of Health and the Culture of Nationalism in Nineteenth-Century America* (New York, 1994), 137–38. I am grateful to Joseph Dauben for alerting me to the relevance of Gage's story.

Dr. Martin A. Couney displayed premature babies in his incubators on Coney Island. He had exhibits at both Dreamland and Luna Park for decades. He also staged presentations at a number of national and international fairs including Paris in 1900, Chicago in 1933, and New York in 1939–1940. The bargain with parents was simple since the latest techniques of care for premature babies were hard to find and expensive to secure. Worried and needy parents offered the babies, and Dr. Couney provided the best nursing and medical care available, paying for it all with showmanship and ticket sales. Gary R. Brown, "The Coney Island Baby Laboratory," *American Heritage of Invention and Technology* 10 (Fall 1994): 24–33, provides substantial visual documentation that supplements the scholarly accounts in William A. Silverman, "Incubator-Baby Side Shows," *Pediatrics* 64 (August 1979): 127–41; and Jeffrey P. Baker, *The Machine in the Nursery: Incubator Technology and the Origins of Newborn Intensive Care* (Baltimore, Md., 1996).





FIGURE 6: “Judge’s Wax Works—The Political Eden Musée.” In the middle section of this two-page spread, the handbill below the baby says, “Pasteur Cleveland Inoculating the Democracy against Spoils, Rabies,” *Judge* (February 20, 1886): 8–9.

diverse figures are lampooned above the caption “Judge’s Wax Works—The Political Eden Musée.” (See Figure 6.) This large and complicated send-up of many political figures is arranged like an exhibit in New York’s famous wax museum. At the center of the drawing—above the tiger representing New York’s famous Tammany Hall and below the brand-new Statue of Liberty—Grover Cleveland, then president, is depicted in the posture of Pasteur performing an inoculation of civil-service reform to prevent corruption in government.<sup>51</sup>

<sup>51</sup> The iconography of this image, a seated physician holding a young child to inoculate him, is unlike any Pasteur image I have seen. Among other things, it would have been inappropriate to show Pasteur performing the operation, something he never did, since he was a chemist, not a physician. But the origin of this figure is clear. It is based, perhaps at one or more removes, on a moderately well-known sculpture by the Italian artist Giulio Monteverde of Edward Jenner inoculating his own son with cowpox. The sculpture, possibly completed as early as 1873, was exhibited at the Exposition Universelle of 1878 in Paris, where it won a medal of honor. One need not assume that it was seen by the cartoonist himself, since an engraving of the sculpture (seen from exactly the same angle as in the cartoon) was published in an American book, *Masterpieces of European Art*, by Philip T. Sandhurst and James Stothers (Philadelphia, 1876). (For a modern photograph, see Lyons and Petrucelli, *Medicine: An Illustrated History*, Fig. 766, p. 492.) The artist of this cartoon was Bernard Gillam, who left *Puck* in mid-December 1885 to become the art director of *Judge*. Gillam was widely celebrated for his creation of a very popular and repeated image of James G. Blaine, a Republican leader who served at various times as representative, senator, secretary of state, but who also garnered notoriety for inflammatory statements, as “the tattooed man,” which first appeared in *Puck*, April 15, 1884, in a cartoon captioned “The national dime museum will be run during the presidential campaign.” See Richard Samuel West,

In March 1886, the boys returned home to Newark from their time on the freak-show circuit, and they apparently remained out of the spotlight except for a striking revival of interest in the 1920s.<sup>52</sup> But just at the time when the excitement over the Newark boys themselves began to fade during March, a new element entered the story, one with far-reaching potential, for at this point Pasteur announced plans to found a large new institute to provide inoculations, and a subscription campaign was begun. Such campaigns were prominent in the 1880s; not only had newspapers solicited the contribution of funds to send the Newark boys to Paris but an American subscription campaign, sponsored by Pulitzer's *World*, to build the pedestal for Frédéric-Auguste Bartholdi's Statue of Liberty had reached its goal of \$100,000 only a few months earlier in August 1885.<sup>53</sup> A successful fund-raising campaign promoted by newspapers around the world would establish the Institut Pasteur, which opened in Paris in November 1888; and, over these two and a half years, American papers reported regularly on the patients of varied nationalities being treated in Paris and on the progress of this campaign.

A humorous piece from early 1886 illustrates additional dimensions of the varied responses to the medical and non-medical fashions generated by Pasteur's rabies work. One seven-frame cartoon published in *Puck* on January 13 started with the obvious pun on "mad dogs" and "mad doctors" but then proceeded to show a veritable Pasteurian revolution in several dimensions of medical education, medical research, and medical practice. Although drawn strictly as humor, it captured in a sophisticated way the epoch-making changes occurring within the medical profession as it was being reshaped by the discoveries of laboratory research. (See Figure 7.)<sup>54</sup>

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*Satire on Stone: The Political Cartoons of Joseph Keppler* (Urbana, Ill., 1988), 275. For context, see also Samuel J. Thomas, "The Tattooed Man Caricatures and the Presidential Campaign of 1884," *Journal of American Culture* 10 (Winter 1987): 1–20.

<sup>52</sup> In 1928, the Newark boys' trip to Paris was used by Parke, Davis, and Co. in a series of advertisements selling their corporate image by proclaiming the miracles of modern medicine. One of the full-page ads pictured the four Newark boys, apparently counting on people's memory to evoke the romantic and mythic qualities of this event. This ad ran in *Hygeia* (October 1928), *Colliers* (September 8, 1928), *The Saturday Evening Post* (September 15, 1928), *Literary Digest* (September 22, 1928), and *National Geographic* (October 1928). Information on the placements of these ads was found in a small folder of letters at the New York Academy of Medicine Library, Special Collections MS 632. That same year, when a monument was erected in Chicago to Pasteur's memory by the people of that city, Willie Lane the messenger boy—by then, a man in his fifties—spoke at the dedication ceremony about Louis Pasteur's personal kindness to him and about his adventures in the dime museums. *Chicago Daily News* (October 27, 1928): 3, cols. 2–5; *Chicago Daily Journal* (October 27, 1928): 3, col. 1; *New York Times* (November 4, 1928), sect. 9, p. 16, cols. 2–3.

<sup>53</sup> The French and American subscription campaigns for the statue are treated at length in *Liberty: The French-American Statue in Art and History* (New York, 1986). In December 1894, when funds were needed to support the manufacture of the newly discovered diphtheria antitoxin, a public subscription campaign was begun by the *New York Herald*.

<sup>54</sup> Amidst the hilarity, the press continued to report the tragic deaths of untreated hydrophobia victims. Not only those of a six-year-old son of a well-to-do New Jersey farmer (*New York Sun* [January 19, 1886]: 2, col. 7) and of a fifteen-year-old in Washington, Georgia (*Sun* [March 1, 1886]: 2, col. 7) but even the suicide of a New York saloon employee, who had been bitten and feared the disease. The paper was careful to note that this William J. Higgins, thirty years of age and unmarried, who shot himself, was "not a drunkard, nor was there a woman in the case. The fear of hydrophobia killed him." *Sun* (February 5, 1886): 1, col. 6.

## THE PROFESSION GONE MAD.



FIGURE 7: “The Profession Gone Mad,” *Puck* (January 13, 1886): 314. Panel captions from upper left: “No More Use for the Human Skeleton,” “Cat-Snatching Instead of Body-Snatching,” “A Fine Opening for Rabbits,” “The Doctors Race for a Case,” “No Time for Common Sick Folks: Doctor.—‘Excuse me, but I have an experiment to make,’” “What the Physicians are Coming To.”

WHAT WE HAVE HERE IN TOTAL IS SOMETHING MORE THAN TRANSITORY attention to a new therapy for a frightening disease. As mentioned, prior advances in medicine did not garner strong or sustained appearances in the American press. In a novel fashion, the hydrophobia drama—because it captured the popular imagination—disseminated effectively, if not intentionally, a new image of the value of experimental research in medicine, helping to create a new expectation of continuing medical advances and implicitly encouraging public commitment to such research. An understanding of those more lasting effects requires closer attention to several important historical features of the press coverage of 1885 and 1886.

First, the media sensation was sustained and amplified by the pragmatic self-interest of editors and their competition for regular readers, entirely independent of this particular story. For the penny papers, vast numbers of readers were required, and any story that could engender daily curiosity about tomorrow’s installment, in the manner of a serialized novel, was a sure winner—and worth promoting. Editors boosted this particular cluster of stories not only by aggressive pursuit of angles and information but by direct participation in the events as well. The Paris correspondent for the *New York Herald* took an active role in making the

news, on occasions like the day he showed Pasteur the “Hydrophobia Boom” cartoon from *Puck* and wired back to New York a report on the encounter. With the same technique that Pulitzer had used a few months earlier for the base of the Statue of Liberty, Bennett of the *Herald* coordinated a fund for sending the Newark children to Paris. Lists of donors created buyers for the paper: to see who gave, how much they gave, and whether anyone they knew might be immortalized. The papers did not limit the donors list to major gifts, like \$100 from A. L. Dennis, \$50 from Dr. O’Gorman, \$30 from Frederick T. Frelinghuysen, \$25 from Miss Halsey, \$25 from Stoutenburg & Co., or \$16.50 from the employees of Stoutenburg & Co. It continued the listing through \$4.20 from employees of the Domestic Manufacturing Company to the ten-cent donations by Cora Syms (age four) and her sister Ida (age six).<sup>55</sup> The newspapers also used the personal lives of the characters to entice readers into grabbing for new installments. After a reporter visited one boy’s home, readers were informed even that “a few cheap prints of sacred subjects hung on the whitewashed walls.”<sup>56</sup> Readers came to know the names, ages, and other personal information about the boys and their families. Once readers learned that Mrs. Ryan was pregnant, there was suspense about whether she might be delivered en route to Europe or in France. Her son was in fact born on the return voyage, after nearly a month of readers’ anticipation. The papers then reported not only on Mr. Ryan’s first look at his new son but also quoted expert opinions on whether the boy, born in mid-ocean on a French steamer, was an American or a French citizen. They told the world he had been named “Louis Pasteur Ryan” (even though the boat’s captain entered “Walter Ryan” on the manifest).<sup>57</sup> For the physicians and other middle-class players in the melodrama, such private information was replaced with stories of their education and professional histories, their ambitions and achievements. But they, too, became celebrities, with their portraits appearing in papers and magazines, even if their home life was not made public and they could afford to refuse invitations to appear on stage in cheap theaters. While many aspects of the rabies-cure coverage were adventitious, the editors were happy to exploit two inherent features of this story that always evoke strong human interest: children and dogs. The added factors of helpless victims, good Samaritans, community fundraising, a perilous voyage, a noble (and conveniently distant) hero, divided opinions among local authorities (who could therefore be interviewed and quoted at length), and a potentially happy ending were of great value as well.

<sup>55</sup> The *Herald*’s first published listing of donors appeared on Sunday, December 6, in a three-column article (p. 7, cols. 4–6). The list appeared on the same day in the *Newark Register* and *New York World*. (A shorter list ran in the *New York Times*.) Just the day before, Pulitzer had offered to pay for the entire trip himself but was publicly assured by Dr. O’Gorman that the funds collected were sufficient. (In October, the *Herald* had published names and amounts of new subscriptions received for the Grant Monument Fund; it is not clear, however, whether the *Herald* was sponsoring that campaign or only reporting results.) Bennett in the *Herald* was not copying a Pulitzer innovation with his Liberty campaign, since Bennett himself had already used this method to raise funds for a monument to General Custer in 1876. I thank Wayne Sarf for alerting me to this further example of what may well have been a common practice.

<sup>56</sup> Further scenic detail: “The room was scrupulously neat, but there was an air of pinched poverty about it. The baleful light of the sunless day stole through the small window panes. The grate of a small, flat-topped cooking stove radiated a stream of light on the well swept rag carpet.” *New York Herald* (December 6, 1885): 7, cols. 4–6.

<sup>57</sup> I am grateful to Caitlin Hawke of the American Pasteur Foundation for showing me a photocopy of this manifest.

Second, the stories were carried in working-class and middle-class daily papers, in newspapers popular with immigrants and those favored by the native born, in the business papers that carried relatively little other news, and in the pictorials, too. They ran in papers of all styles from the *Graphic* and the sensation-seeking *World* to the more serious *Tribune* and *Times*.<sup>58</sup> Lengthy, instructive treatments of the development and triumph of the rabies vaccine were not limited to monthly journals of ideas, such as *Atlantic*, *Century*, *Harper's Monthly*, *Littell's Living Age*, and *North American Review*, but were available to a much larger audience. The mass circulation of the rabies vaccine story sets it apart from the public treatments of intellectual controversies in science that had been carried in elite periodicals, not in mass-circulation newspapers.<sup>59</sup> Magazine attention was not limited to news and feature articles; numerous cartoons, jokes, and political caricatures by leading artists also incorporated the rabies-cure imagery, confirming its vogue.<sup>60</sup>

Third, the coverage was vast. In the months of December and January, there was at least one news article almost every day in each of the New York papers and often four or more in the same paper—in addition to editorials, letters from readers, and related jokes and witticisms. On at least two days, more than 10 percent of the *Herald's* space was devoted to rabies and its cure. Readers were so eager for the story that the *Herald*, so it claimed, was selling out by 9 a.m. The *Herald* (admittedly the most copious in rabies coverage) printed in December seventeen editorials, thirty-one letters to the editor, seventeen cable dispatches from Paris or London, and seventy-three news articles. In January, the *Herald* published ninety-eight different items. Slightly less abundant was coverage in the *Times*, where seventy items on some aspect of the rabies cure appeared during December, January, and February. The same three months saw 125 items printed in Pulitzer's *New York*

<sup>58</sup> The readership and constituencies of New York's papers in the 1880s not only varied among themselves but were different from those of the same papers in later years. The *New York Times*, for example, was not the paper of record it later became. Having read more than a thousand, often repetitive, rabies-related articles from the daily press, I believe that more attention to differences in the papers' character and to the variations in their coverage of the rabies stories would not significantly modify the general claims of this article about a broadly dispersed awareness of the initial public triumph of laboratory medicine.

<sup>59</sup> Relevant examples include British or American writings about Charles Darwin's evolutionary theory and the French debates about spontaneous generation. On the latter, see Anne Diara, "Un débat français vu par la Presse, 1858–1869: L. Pasteur—F. A. Pouchet et la génération spontanée," *Actes du Muséum de Rouen* 6 (1984): 176–210. Although the rabies breakthrough was covered in the daily French press, no one to my knowledge has studied the extent or nature of this coverage. Bernadette Bensaude-Vincent studied publications on spontaneous generation and on the rabies vaccine but limited herself to scientific journals; see "Louis Pasteur face à la presse scientifique," in *L'Institut Pasteur: Contributions à son histoire*, Michel Morange, ed. (Paris, 1991), 75–88.

<sup>60</sup> Striking examples appeared not only in *Puck* and *Judge* as indicated above but in *Harper's Weekly* and *Life* as well. Even America's most famous political cartoonist took up the topic. Thomas Nast's sarcasm illuminated his image of angry men brandishing clubs, chains, and guns as they chase a small lap dog with a ribbon in its hair. "It Is Modern Civilization That Drives the Dogs Mad," *Harper's Weekly*, January 9, 1886. He chided the newspapers about their sensationalism with "The Dog's Day," in which three handsome hunting dogs are pawing through newspapers with names like *The Daily Hydrophobic Press*, *The Daily Craze*, *The Daily Scare*, and *The Hydrophobia*. They demand, "Muzzle the reporter," and offer "a reward for newspapermen who have not hydrophobia." *Harper's Weekly*, January 30, 1886. On March 13, 1886, he mocked "The Rabid Editor" in another *Harper's Weekly* cartoon. While these topical cartoons made fun of a fad, Nast had previously used dog-pound imagery and even hydrophobia repeatedly in his attacks on political corruption; in *Harper's Weekly*, see a full page on July 11, 1874: 580; a full page on July 6, 1878: 528; and the front cover on July 9, 1881: 437.

*World*, including at least two advertisements trying to ride the wave of hydrophobia excitement.<sup>61</sup> A search of the *Times* for the later months revealed a continuing stream, if no longer a flood, of articles, letters, etc.: twelve in March, eleven in April, three in May, six in June, and some in succeeding months, too. Of course, New York's *Courier des Etats-Unis* gave the story full play.<sup>62</sup> This fascination with Pasteur and his American patients sustained the breakthrough's high visibility for months, with effects persisting for years. While the frequency of articles dwindled later in 1886, they did not disappear, rising again in the summer of 1887, when a British royal commission on rabies offered its report on Pasteur's work, and especially in 1888 when the Pasteur Institute was opened in Paris. A later flurry of attention was prompted by Pasteur's seventieth birthday in 1892 and another by his death in 1895.<sup>63</sup>

Fourth, reports on the rabies discovery and the related American adventures were widely distributed. The enthusiasm for following the fortunes of the Newark boys spread across the continent (and beyond). Articles are found in small-town newspapers as well as the big city press, from Jacksonville, Florida, to Ottawa, Ontario, and from Danbury (Connecticut), Nashville, Chicago, Los Angeles, out to Honolulu.<sup>64</sup>

Fifth, the new images took hold almost instantly among a broad public, rather than spreading out gradually from the small community of medical scientists. Without the attention cultivated by the daily newspapers and relished by their readers, the new treatment for rabies, like earlier medical discoveries, would probably have changed expectations about medical progress slowly, if at all, within an intellectual elite. In time, those ideas might have made their way bit by bit into the general culture, as did awareness of ether anesthesia and the germ theory. But

<sup>61</sup> Both ads appeared on page 3, December 20: "Hydrophobia Cured. It is now the fashion to go to Paris to seek a cure. Better stay at home, saving your \$1,000, and using a 25c. box of HENRY'S CARBOLIC SALVE, the best healing Ointment in the world. It not only purifies the wound, but is recommended by Physicians for cuts, sores, bruises, burns. Be careful to ask for *Henry's*, as the counterfeits are all worthless." "Mad Dogs. A FACT WORTH KNOWING. THE GREATEST PAIN RELIEVER OF THE WORLD. DR. TOBIAS' CELEBRATED VENETIAN LINIMENT applied immediately upon being bitten eradicates all danger of Hydrophobia ever existing. Price 25c and 50c. Sold by all druggists.—Adv."

<sup>62</sup> I have not checked the other foreign-language papers in New York for the rabies story. On other medical topics, such as outbreaks of epidemics, the foreign-language press sometimes diverges significantly from the direction of the English-language papers. My thanks to one of my students, Gregory Robinson, for this information from a 1989 graduate course paper on the 1916 polio epidemic using New York's German and Italian papers. Howard Markel's book on cholera and typhus fever epidemics in the 1890s includes an analysis of the New York Yiddish papers' handling of the issues: *Quarantine! East European Jewish Immigrants and the New York City Epidemics of 1892* (Baltimore, Md., 1997).

<sup>63</sup> One scholar's statistical examination of *New York Times* coverage of Darwin's ideas showed a similar pattern in which the "event orientation" of the press meant that quiescent intervals alternated with bursts of attention prompted by publication of the *Origin of Species*, Thomas H. Huxley's visit to the United States promoting it, Darwin's death, the centennial of Darwin's birth, and the Scopes trial. See Ed Caudill, "A Content Analysis of Press Views of Darwin's Evolutionary Theory, 1860–1925," *Journalism Quarterly* 64 (Winter 1987): 782–86, 946.

<sup>64</sup> These cities are only those for which my students or I have had the opportunity to examine the newspapers. It is possible that a thorough examination of other papers, such as those in Boston and Philadelphia, might reveal different emphases or even different stories. As one example, I note that the *Danbury Evening News* reprinted from the *Boston Globe* an interview with Dr. Grancher, Pasteur's assisting physician (December 31, 1885).

the rabies-cure sensation precluded gradual development in two distinct ways, by rapidly disseminating the stories and pictures widely to different regions and different social classes and by penetrating deeply into people's awareness through the large quantity of verbal and visual stimuli with sustained repetition of images.<sup>65</sup>

FROM THE DELUGE OF PUBLICITY ABOUT PASTEUR AND HIS NEWARK BOYS came a number of further developments, which then took on lives of their own and continued to change the social contexts and imagery of medicine in America. The latest techniques started to displace traditional images of medical care in popular writings and graphics, Pasteur Institutes were founded in several American cities, a concept of "medical researcher" entered public awareness, and additional medical breakthroughs came to be expected. Each of these historical shifts should be considered briefly before we turn to a few subsequent breakthroughs and the contours of their media coverage.

Political caricature is a useful subject in which to observe a change in the nature of popular medical images precisely because it has no inherent relationship to medicine or medical institutions. In a caricature one year before the Pasteur boom, the Democratic Party appears as an invalid in a bathrobe with a bandaged tumor visible on his leg, propped up on cushions. Three well-dressed doctors (whose faces may be recognized as belonging to editors of leading newspapers) stand and argue about the case. Dr. Puck, with top hat, has just been called into consultation about "The Very Sick Party."<sup>66</sup> This kind of traditional medical imagery had long been common: doctors bandaging, giving large spoonfuls of medicines, and even—in a

<sup>65</sup> The numerous jokes (and the way they were copied and recopied) further confirms the broad and repeated attention given to this fad. On December 27, for example, the *Newark Sunday Call's* "Humors of the Day" column with its "Dogmatic Humor" offered six quips from out-of-town papers about the rabies mania, including the following three samples (p. 7, col. 3): "Paris has lost 115,000 population in the last four years, but if the emigration of dog bitten Jerseymen continues, she will soon make it up (Pittsburg Chronicle)"; "It is not enough, it appears, to be bitten by a mad dog in New Jersey, but the New York papers add to the victims' agony by printing their pictures (Pittsburg Telegraph)"; and "Down in Newark, N.J., the population devotes its time to the chasing of mad dogs. Amateur marksmen have an excellent chance to practice, while of course, the dogs escape uninjured (Boston Globe)." On New Year's Day 1886, *Life* magazine (p. 10) ran a cartoon under the caption "Thanks to Dr. Pasteur," showing two children, one holding a little dog, with the other one demanding, "Sick him on me, Jimmy, I want ter go to Paris!" On January 15, 1886, after weeks of daily reports about medical opinions on the new cure, the *Daily Graphic* quipped, "Dr. Billings has great confidence in Dr. Pasteur's system, with the exception of a few inadvertent doubts" (p. 506, col. 1). The next example is interesting because it appeared in at least four publications, illustrating how widely the papers cannibalized each other's material and even commented on the borrowing. On January 12, 1886, the *Times* ran this short item in a column called "Jottings Here and There" (p. 4, col. 6): "More people die in one year from trichiniasis than in 20 years from hydrophobia. Yet the owners of hogs pay no tax, buy no muzzles, and have no hogs shot down.—*Milwaukee Sentinel*." Three days later, the joke was tightened a little and alliteration added in the *Daily Graphic* (p. 2, col. 3): "It is asserted that more people die in one year from trichinosis than in twenty years from hydrophobia. If this is so, M. Pasteur might better devote his attention to the hogs instead of letting it go to the dogs." Three days after that, *Puck* tightened it more, improved the alliteration, and made it self-referential (p. 323): "An exchange says that more people die in a year from trichiniasis than in twenty years from hydrophobia. Here is a chance for some enterprising journalist to turn the dog-scare into a hog-scare." Even those enterprising humorists who regularly exploited the immigrant Irish also found a way to use the latest fad: "Mrs. Muldoon: 'Mrs. Mulcahey, have ye heard the new rimidy for hydrophoby?' Mrs. Mulcahey: 'No, faith; phat is it?' Mrs. Muldoon: 'P(l)asteur of Paris, begorra!'" *Puck* (January 27, 1886): 343.

<sup>66</sup> *Puck* (June 25, 1884): 272.

less squeamish age than ours—about to perform enemas. (The stethoscope and hypodermic syringe had not yet become symbols of the profession.) An example of the new medical iconography, by contrast, is seen in Figure 6. With all the publicity about the new Parisian therapy, no one could miss the references. The innovation in this representation is that, unlike the older, commonplace image of doctors consulting on a case, the new satire exploited the very latest breakthrough, focusing on a new medical technique, not the traditional ones.<sup>67</sup>

Institutional developments further reinforced the effects of the media coverage. In the United States within a month of the Newark dog's rampage, two Pasteur Institutes were organized (or at least attempted). Groups in both St. Louis and New York City announced in late December their intention to create facilities producing the biological material needed to treat dog-bite victims on this side of the Atlantic. Since it was believed the remedy needed to be given as soon as possible after the bites, nearby treatment (or at least without ocean travel) would surely save lives. A number of factors inhibited formation of the New York institute, including some hesitation from Pasteur and a failed attempt to raise funds. These efforts were reported and debated in news articles, editorials, and letters in the daily press over much of 1886. I have found no evidence that it ever formally opened, although at least one patient was treated in July 1886. This effort, it appears, was distinct from a better known New York Pasteur Institute established by Paul Gibier in 1890. Whether the St. Louis group (announced in the *New York Times* and several other papers on January 1, 1886) had better success is something I have not been able to ascertain. But several other American treatment centers bearing the name "Pasteur Institute" were established over the years, and they treated dog-bite victims, often in large numbers: in Chicago from 1890 to about 1944, in New York from 1890 to 1918, in Baltimore from 1897 to 1909 at least, in Ann Arbor, Michigan, from 1903 to 1926 at least, and perhaps in Philadelphia (existence and dates unconfirmed).<sup>68</sup>

<sup>67</sup> Two other striking examples of cartoonists' rapid utilization of the latest therapeutic fads appeared in 1889 and 1890. The first, a lively attack on the commissioner of pensions, "It Beats Brown-Séguard.—Tanner's Infallible Elixer of Life, for Pension-Grabbers Only," is described below in the discussion of Charles-Edouard Brown-Séguard's discovery. The second example is "A Bad Case of Consumption—Blaine Tries an Injection of Reciprocity Lymph," where a sick Republican elephant is to receive an injection from James G. Blaine. This caricature, in *Puck* (December 10, 1890): 276–77, refers to the tuberculin or lymph cure for tuberculosis that Koch had announced just weeks earlier. Reprinted in David Leibowitz, "Scientific Failure in an Age of Optimism: Public Reaction to Robert Koch's Tuberculin Cure," *New York State Journal of Medicine* 93 (January 1993): 41–48.

<sup>68</sup> For assistance in tracking down these institutes, I wish to thank James H. Cassidy, Jon M. Harkness, Caitlin Hawke, Howard Markel, and Edward Morman. For the Chicago story, see Jon M. Harkness, "Rabies, Research, and Public Health: A History of the Chicago Pasteur Institute" (unpublished paper, University of Wisconsin, revised version, December 1987); and Paul G. Clark, *Pioneer Microbiologists of America* (Madison, Wis., 1961), 243, 249. Harkness also mentions the Chicago institute in "Reception of Pasteur's Rabies Vaccine." The New York institute survived the death of Gibier in 1900 only in a limited fashion; the city's Department of Health began its own rabies work in the late 1890s. See Paul Gibier, "The Pasteur Treatment," *North American Review* 15 (August 1890): 160–66; Henry Smith Williams, "How Antitoxines Are Developed," *Harper's Weekly* (January 5, 1895): 8; a not entirely reliable account in James J. Walsh, *History of Medicine in New York* (New York, 1919), 3: 872–74; and Gibier's own *Bulletin of the Pasteur Institute*, 8 vols. (1893–1900); vols. 1–4 under the title *New York Therapeutic Review*. See also an unpublished paper by Jon M. Harkness, "Rabies and Research: A History of the New York Pasteur Institute" (presented at the American Association for the History of Medicine, Annual Meeting, April 1989).

For the Baltimore operation, see Nathaniel Garland Keirle, *Studies in Rabies* (Baltimore, Md., 1909), *passim*; and Eugene Fauntleroy Cordell, *The Medical Annals of Maryland* (Baltimore, 1903), 464–65,



A third important change is that, while the role of medical researcher came into American public consciousness through the publicity about Pasteur, it was not limited to the great French scientist. America had only a few physicians in the later nineteenth century who were making their livelihood without seeing patients, and they were not in the public eye. Men such as the physiological researcher John Call Dalton, Jr., at the College of Physicians and Surgeons were at most known publicly for statements about the appropriateness of vivisection.<sup>69</sup> With so little prior awareness of physicians who conducted research, the newspapers were understandably fascinated by the German-trained Dr. Frank Seaver Billings of Boston, who was in New York City and volunteered to accompany the Newark children to Paris. Having studied in European laboratories, this veterinarian seemed just the right person to go along. Moreover, the scientifically prestigious Appleton and Co. had just published his major work, including a chapter on rabies.<sup>70</sup> But as interesting to the press as any specific knowledge he had was the shape of his career. One New York paper portrayed Billings as “the first American who ever entered upon the study of medicine with the sole purpose of devoting his life to original research and the prevention of disease entirely regardless of making money.”<sup>71</sup> Even surrounded by the media madness, Billings knew how to promote the scientific work he valued. In an interview at the residence of Dr. H. C. H. Herold, president of the Board of Health, Billings told the *New York Herald*, “I am sure [the wide publicity] will open up a new channel for original research and stimulate those who have been laboring zealously for a chemical laboratory on an extensive scale.”<sup>72</sup> Being proclaimed “the first American . . . devoting his life to original research . . . regardless of making

730. On Ann Arbor, see the *Washtenaw Daily Times* (March 6, 1903, and April 13, 1903); *The University of Michigan: An Encyclopedic Survey*, Wilfred B. Shaw, ed. (Ann Arbor, Mich., 1951), 2: 779, 826, 982; and Victor C. Vaughan, *A Doctor's Memories* (Indianapolis, Ind., 1926), 235–36, who claimed his was the only such institute west of New York, either ignoring or devaluing the commercial endeavor in Chicago. Early treatment in Philadelphia was mentioned by Hermann M. Biggs, writing many years later in the *New York Times* (December 31, 1922), sec. 8, p. 4, col. 5.

<sup>69</sup> W. Bruce Fye, *The Development of American Physiology: Scientific Medicine in the Nineteenth Century* (Baltimore, Md., 1987); Dalton is the subject of chap. 1. On the difficulty of finding ways to support research in bacteriology, see Patricia Peck Gossel, “The Emergence of American Bacteriology, 1875–1900” (PhD dissertation, Johns Hopkins University, 1988), 204–23.

<sup>70</sup> Frank Seaver Billings, *The Relation of Animal Diseases to the Public Health, and Their Prevention* (New York, 1884). This is a book of 455 pages; the chapter on rabies runs pp. 139–53. Its title page identifies him as “Frank S. Billings, D.V.S., Graduate of the Royal Veterinary Institute of Berlin; Member of the Royal Veterinary Association of the Province of Brandenburg; Honorary Member of the Veterinary Society of Montreal, Canada, etc.” This irascible and erratic personality should not be confused with a more famous Chicago physician named Frank Billings, although I believe he is the author identified as “Frank S. Billings, M.D., Chicago” who published a hostile attack on Pasteur’s method of preventing rabies in the *Medical Standard* (Chicago) 8: 4 (October 1890): 97–99. His account of travel with the Newark boys was published as “Fourteen Days with Pasteur,” *The Medical News* (Philadelphia, a weekly) (January 23, 1886): 90–96. Some information on other aspects of his career is found in John L. Gignilliat, “Pigs, Politics, and Protection: The European Boycott of American Pork, 1879–1891,” *Agricultural History* 35 (January 1961): 3–12; Gossel, “Emergence of American Bacteriology, 1875–1900,” 125–29; Richard A. Overfield, “Hog Cholera, Texas Fever, and Frank S. Billings: An Episode in Nebraska Veterinary Science,” *Nebraska History* 57 (Spring 1976): 99–128, which includes a portrait photograph on 101; and *American Men of Science: A Biographical Directory*, James McKeen Cattell, ed. (New York, 1906), 29.

<sup>71</sup> *New York World* (December 10, 1885): 11.

<sup>72</sup> *New York Herald* (December 7, 1885): 5, col. 4. I am grateful to John Rescigno, M.D., who undertook a historical research project in 1987 while a medical student, for bringing the last two quotations to my attention.

money” was a remarkable accolade in the Gilded Age. In addition, lengthy reports about the operations within the Pasteur laboratory—interspersed among the stories about the Newark boys—supplemented a picture the press was developing of Dr. Billings and other Americans engaged in research.

The public, in fact, moved ahead of the profession in its enthusiasm for rabies treatment, for microbes in medicine, and for optimism about a stream of new advances. During the 1880s, the medical profession for the most part did not share the public's unquestioning support of the rabies treatment.<sup>73</sup> American doctors as a group had uncertain and conflicted responses to bacteriological science in general and were hesitant to accept its potential contributions to medicine. Scholars have established these general features, but we do not yet have a definitive account, since most published scholarship on the changing place of science in American medicine focuses on physiology as the major instance, with far less attention to pathology and its stepchild bacteriology.<sup>74</sup> Historians generally attribute the significant hesitation among American physicians about bacteriology to its not being therapeutically useful for practice.<sup>75</sup> Since rabies cases were so infrequent, physicians, even forward-looking ones, did not share the public's sense that this was a big change. But the profession did, in time, come to support the rabies vaccine and bacteriology in general in the decade or so after 1885. An exhaustive examination of the professional literature would be needed to determine just how the familiarity of laypeople with new discoveries and their enthusiasm for the first therapies that appeared from the lab might have played a direct role in doctors' reevaluation. But it clearly played at least an indirect role by shaping one major cause of change: the aggressive (and publicly successful) initiatives of Hermann Biggs and T. Mitchell

<sup>73</sup> The American doctors' cautious interpretations of Pasteur's treatment would merit a full investigation. A start was made in the short but highly professional 31-page thesis by Harkness, "Reception of Pasteur's Rabies Vaccine in America"; and in Hoenig, "Pasteur's Preventive Treatment of Rabies as Reported in *JAMA*." See also Blaisdell, "With Certain Reservations."

<sup>74</sup> See Gerald L. Geison, "Divided We Stand: Physiologists and Clinicians in the American Context," in *The Therapeutic Revolution: Essays in the Social History of American Medicine*, Morris J. Vogel and Charles E. Rosenberg, eds. (Philadelphia, 1979), 67–90; John Harley Warner, "The Fall and Rise of Professional Mystery: Epistemology, Authority, and the Emergence of Laboratory Medicine in Nineteenth-Century America," in *The Laboratory Revolution in Medicine*, Andrew Cunningham and Perry Williams, eds. (Cambridge, 1992), 110–41; Warner, "Ideals of Science and Their Discontents in Late Nineteenth-Century American Medicine," *Isis* 82 (1991): 454–78; and Warner, *The Therapeutic Perspective: Medical Practice, Knowledge, and Identity in America, 1820–1885* (Cambridge, Mass., 1986). Two brief but useful exceptions to physiology's dominance in the historical literature are Russell C. Maulitz, "'Physician Versus Bacteriologist': The Ideology of Science in Clinical Medicine," in *Therapeutic Revolution*, 91–107; and King, *American Medicine Comes of Age, 1840–1920*, esp. 32–36, 46–50. Four dissertations address this lacuna; see David Anthony Blancher, "Workshops of the Bacteriological Revolution: A History of the Laboratories of the New York City Department of Health, 1892–1912" (PhD dissertation, City University of New York, 1979); Gossel, "Emergence of American Bacteriology"; Evelyn M. Hammonds, "The Search for Perfect Control: A Social History of Diphtheria, 1880–1930" (PhD dissertation, Harvard University, 1993); and John Andrew Mendelsohn, "Cultures of Bacteriology: Formation and Transformation of a Science in France and Germany, 1870–1914" (PhD dissertation, Princeton University, 1996). Despite Mendelsohn's European focus, two sections of chap. 8 are relevant here: "Public Health Bacteriology and Changes in Science: The Example of Diphtheria in New York City" (490–509) and "Hospital Bacteriology and Change in Science: The Example of Typhoid" (509–22).

<sup>75</sup> Veterinarians, according to Gossel, were an exception; their interest picks up about a decade earlier; see "Emergence of American Bacteriology," 108–10. On the medical profession's hesitations about bacteriology, see Maulitz, "'Physician versus Bacteriologist,'" 96; Warner, *Therapeutic Perspective*, 277–81; and Gossel, 164–65; none of these mentions the rabies enthusiasm at all.

Prudden at the New York City health department, starting in 1892, to use the new bacteriological laboratory as their major weapon against cholera, tuberculosis, and diphtheria in a very public way. Significantly, these men had observed the rabies enthusiasm firsthand and seem to have learned from it about the political leverage one could draw from public enthusiasms.<sup>76</sup>

As the public became familiar with laboratory research, people also learned that such efforts needed financial support. Much of the initial willingness to make contributions to the cause was simply a continuation of the longstanding tradition of supporting needy patients through charity. Donations to send the boys to Paris were of this kind. Gifts to build the Pasteur Institute, solicited after March 1886, also tapped this old philanthropic impulse, rather than a commitment to research per se. But because of the Pasteur sensation, the excitement about the utility of discovery, and a growing hope for more, people came to see the value of investing in laboratory medicine. It seems to me more than coincidence that *public* funding for medical laboratories in America started up in the years immediately following this wave of popular enthusiasm about successful laboratory research, even though a direct connection would be hard to establish. Many other factors, of course, contributed to the trend, but it is striking that 1887 saw the establishment of the first federal public health laboratory and two municipal labs and that “by 1900 many states and all of America’s forty largest cities boasted such facilities.”<sup>77</sup> One clear indication that some medical leaders saw a connection between popular enthusiasm and financial support for public laboratories is the way Biggs used the lessons of the Pasteur episode. He exhibited a profound appreciation for public relations and the cultivation of the public’s support to ensure funding, especially in his work with the newspapers to promote introduction of the new diphtheria antitoxin, which he brought back from Europe after visiting research laboratories there in the summer of 1894.<sup>78</sup>

AS SUCCESSIVE BREAKTHROUGHS FOLLOWED THE RABIES TRIUMPH over the next few years, they were portrayed in the popular media largely along patterns established

<sup>76</sup> In fact, Biggs went to Paris to learn about the rabies work in Pasteur’s laboratory at roughly the same time as the Newark boys’ treatment, although—contrary to the statements of Blancher, “Workshops of the Bacteriological Revolution,” 28, and Elizabeth Fee and Evelyn M. Hammonds, “Science, Politics, and the Art of Persuasion: Promoting the New Scientific Medicine in New York City,” in *Hives of Sickness: Public Health and Epidemics in New York City*, David Rosner, ed. (New Brunswick, N.J., 1995), 158—he did not accompany the children. Biggs was probably on a later steamer, but he did meet with Pasteur in late December, before continuing his laboratory visits in Germany. Prudden’s interest in the press is illustrated in a scrapbook of extensive newspaper clippings of the tuberculin episode, “Koch’s Tuberculin,” now in the Library of the New York Academy of Medicine, called to my attention by David Leibowitz in 1986.

<sup>77</sup> Gossel, “Emergence of American Bacteriology,” 282, citing Charles V. Chapin, *Municipal Sanitation in the United States* (1901), 556–59. See also Victoria A. Harden, *Inventing the NIH: Federal Biomedical Research Policy, 1887–1937* (Baltimore, Md., 1986); and Blancher, “Workshops of the Bacteriological Revolution.”

<sup>78</sup> On the importance of the press and the public in Biggs’s diphtheria campaign, the pioneering examination is Jean Howson, “‘Sure Cure for Diphtheria’: Medicine and the New York Newspapers in 1894” (unpublished graduate course paper, History Department, New York University in 1986). Howson’s work is used by Hammonds, “Search for Perfect Control,” esp. chap. 3; and by Fee and Hammonds, “Science, Politics, and the Art of Persuasion.”

by the Pasteur boom. Numerous features of the rabies triumph recurred consistently; it seems almost to have established a template. To highlight these aspects in subsequent episodes, it will be helpful to review some of the character types established in the initial breakthrough.<sup>79</sup>

The heroic and selfless scientist. By mixing the images of Pasteur's genius, his special kindness to the young patients, and his role as benefactor to the human race, the reportage articulated a notion of medicine as characterized by progress, heroism, altruism, and public benefits. It is significant that, while the cartoonists and writers made great fun of the popular enthusiasm, none of the extensive American satire was directed at Pasteur himself.

Worthy patients. Individuals, some desperate enough to travel great distances for a miracle cure, were named, pictured, interviewed for the media, and sometimes even placed on exhibition.<sup>80</sup>

The victim child. This special case of "worthy patient," then and now, has a unique power of its own. Children make any medical story more poignant, and the easy sympathy has frequently been exploited by press, physicians, medical charities, and many others since the 1880s. Pasteur's personal concern for children was genuine, but it also served him well with the press. Child victims of disease became central to the drama of the diphtheria breakthrough in the 1890s, and they also played an important visual role among early beneficiaries of insulin treatment in the 1920s.<sup>81</sup> No one today who lived through the 1950s in the United States needs to be told about the popularity of children in the imagery of the polio vaccine breakthrough or of their role in the March of Dimes campaigns.

Local physicians. Trying to replicate the work so as to provide treatment to Americans at home, they also constituted an additional source of interviews, opinions, controversy, and published letters.

Good Samaritans. Like the local physician who called for a public subscription to pay the Newark boys' steamer fares and the haberdasher who donated warm clothing for the boys' trip, hundreds, perhaps thousands, of unrelated individuals became active participants in the story through the subscription campaign. Donations from children and from school groups were noteworthy and perhaps unprecedented, and not without consequence; fifty years later, when anti-polio campaigns of the 1930s employed advertising techniques "particularly oriented around chil-

<sup>79</sup> I have limited my efforts in the present study to documenting the magnitude of this breakthrough, its major contours, and some of its significant effects. Other investigations might profitably pursue antecedents and formative influences, seeking to explain, for example, why certain elements (dogs, children, physician as lab-based humanitarian, etc.) were incorporated in the representations of this episode in the 1880s. Over the nineteenth century, there had been, of course, many doctors and some scientists portrayed in literature, from Mary Shelley's Dr. Frankenstein onward through later novels, such as those of William A. Hammond, M.D., physiologist and neurologist, U.S. surgeon general, commentator on the rabies cure, oft-quoted medical expert for the daily press, and promoter of the new organotherapy in the mode of Brown-Séguard. Hammond published nine novels (one co-authored with his daughter) between 1867 and 1901, with physicians and medical issues present in several, including *Doctor Grattan: A Novel* (1885). See Bonnie Ellen Blustein, *Preserve Your Love for Science: Life of William A. Hammond, American Neurologist* (Cambridge, 1991).

<sup>80</sup> News photographs of pioneering heart-transplant patients and their appearances on television are noted above and discussed in Fox and Swazey, *Spare Parts*.

<sup>81</sup> Michael Bliss, *The Discovery of Insulin* (Chicago, 1982), provides a rich account, including several pathetic photographs of children taken before their miraculous recoveries.

dren as both potential victims *and donors*,”<sup>82</sup> they were using a potent combination first established in 1885.

Philanthropists, fund-raisers, and other cheerleaders. Some contributed money, others used the power of the press. It should be noted that, just fifteen years later, one singularly important new cheerleader would join the others: the Nobel Prize Committee. These famous prizes added a prominent new element to patterns of public recognition of medical breakthroughs when the first prize in Physiology and Medicine was awarded in 1901 to Emil Behring for achievements that included his contributions to serum therapy for diphtheria.

Animals used in the experiments. In the rabies episode, their essential role was reported as if vivisection were noncontroversial. The animals, without being individualized like the patients or given extra prominence, were not kept out of sight—even those vivisected or sacrificed to produce the therapeutic material. Illustrations of Pasteur’s laboratory showed the caged rabbits and dogs and the operations performed upon them, as did the portrayal of the Newark doctors trying their own experiments. (See Figure 4 above.) Verbal accounts indicated clearly that many animals were killed, sometimes by instruments and other times by the disease they had been given. A representative article in a morning newspaper, “In Pasteur’s Laboratory: Watching the Inoculation of a Rabbit with the Virus,” gave a very straightforward description of grabbing the rabbit, scissoring the fur on its skull, tying it down, forcing it to inhale chloroform, cutting open the skin between the eyes, stretching the skin back with a piece of wire, and then auguring a hole through the skull bone to insert a needle into the rabbit’s brain.<sup>83</sup> Even the procedure of forcing healthy dogs to be bitten by rabid ones was described in the popular media. Furthermore, new rabbits were continually needed, even after the research stage was over, to make the therapeutic substance and to serve as the culture medium in determining whether a dog that bit someone was truly rabid. These procedures were regularly mentioned without sensation in the daily press.

Through the rabies-cure enthusiasm, vivisection became a familiar idea presented in a positive light, and it garnered valuable popular legitimation a number of years before an antivivisection movement could gain momentum in the United States. From the outset, scientists among New York’s physicians knew the importance of vivisection and how to argue publicly for its value. For example, in discussing the proposed New York Pasteur Institute in late December 1885, Professor Adolph Corbett, to be superintendent of the new institute, told the *New York Herald* reporter:

We will probably run against Mr. Bergh [president of the ASPCA] when we get to work on the dogs and rabbits which are necessary to operate with. In that case we shall fight him. Mr. Bergh loves the animals, so do I, *but I love the people more. We will kill as many dogs as are necessary.* At the present time there are 150 patients under M. Pasteur’s care. In my opinion the lives of all the loose curs in the world are as naught *when the sacrifice can save those human beings.*<sup>84</sup>

<sup>82</sup> Naomi Rogers, *Dirt and Disease: Polio before FDR* (New Brunswick, N.J., 1992), 170, emphasis added.

<sup>83</sup> A cable dispatch printed in the *New York Herald* (December 27, 1885): 5, col. 1.

<sup>84</sup> *New York Herald* (December 31, 1885): 3, col. 3, emphasis added. Henry Bergh founded the

I believe that, even more than the easy popularity of such utilitarian arguments, it was the uncritical wave of enthusiasm for Pasteur's apparent triumph in saving children's lives that provided unintended but remarkably effective promotion of vivisection. This process helps to account for antivivisectionism coming to the fore so much later in the United States than in Britain and for its failure to achieve either popular or legislative success.<sup>85</sup>

Media workers. They presented the miracle for widespread consumption through news, editorials, illustrations, cartoons, caricatures, photographs, jokes, poems, and popular songs. Among other activities, they interviewed all the characters except the animals. But, even without interviews, newspapers and magazines did offer numerous illustrations of the biting dogs, the experimental dogs, and the strays in the pound.<sup>86</sup>

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ASPCA in 1866. During the two decades before the Pasteur breakthrough, he had often used the press successfully to raise his issues but had just as often been criticized and satirized in a long-running feud with the *Herald* and in quite a number of hostile caricatures in *Harper's Weekly* and *Puck*. His run-ins with P. T. Barnum received more coverage than those with medical leaders. Since his campaign for protecting animals began with a concern for the way workingmen treated their horses, he was frequently attacked for worrying more about hardships to lower animals than to the workers themselves. When he began to protest the inhumane care given to turtles on their way to the soup pot, he exposed himself to ridicule as well as criticism. His efforts also included changes in dog-pound procedures and the reduction of the bounty for strays from 50 to 25 cents. During the months of press enthusiasm for Pasteur's treatment of the Newark children, Bergh and his friends (including John T. Hoffman, ex-governor and former mayor) showered the papers with letters attacking vivisection, the apparent value of Pasteur's treatment, and the newly expeditious dispatching of stray dogs by the authorities. See the non-scholarly account by Zulma Steele, *Angel in Top Hat* (New York, 1942), esp. 137–40, supplemented by useful information in two books on Bergh's sometime opponent, Barnum: Harris, *Humbug*; and A. H. Saxon, *P. T. Barnum: The Legend and the Man* (New York, 1989).

<sup>85</sup> The New York physiology researcher Dr. John Call Dalton, Jr., had faced off with some antivivisectionists during the decades before the Pasteur boom, but the skirmishes were small and local. See Fye, *Development of American Physiology*, 15–53. The first important battle of American doctors with antivivisectionists took place only at the end of the century. See Patricia Peck Gossel, "William Henry Welch and the Antivivisection Legislation in the District of Columbia, 1896–1900," *Journal of the History of Medicine* 40 (1985): 397–419; Susan Lederer, "The Controversy over Animal Experimentation in America, 1880–1914," in *Vivisection in Historical Perspective*, Nicolaas A. Rupke, ed. (London, 1987), 236–58; and Harriet Ritvo, "Plus ça change: Anti-vivisection Then and Now," *Science, Technology, and Human Values* 9 (Spring 1984): 57–66. For general background on both Britain and America, see James Turner, *Reckoning with the Beast: Animals, Pain, and Humanity in the Victorian Mind* (Baltimore, Md., 1980). Although it deals only with Britain, Richard D. French, *Antivivisection and Medical Science in Victorian Society* (Princeton, N.J., 1975), offers relevant information and elegant analysis.

<sup>86</sup> Images of heroic dogs that survived experimental surgery have been especially popular. In the diphtheria-cure episode of 1894, horses would even become the media stars, competing for attention with the dying babies who recovered quickly after treatment arrived at the last moment. Dogs would return as heroes in the insulin breakthrough in the 1920s and the blue-baby operations of the 1950s and 1960s. On dogs in diabetes research, see Bliss, *Discovery of Insulin*. On the adaptation of the Blalock operation by Willis J. Potts so it could be used in infants, see Clare L. McCausland, *An Element of Love: A History of the Children's Memorial Hospital of Chicago* (Chicago, 1981), 120–22. The first dog to undergo Dr. Potts's new procedure recovered quickly and "became a hero around the Hospital." The hospital installed a bronze plaque inscribed: "To Caesar—Dog Hero, Who Served in the Development of the Blue Baby Operations . . . For Distinguished Service to Humanity." This dog was also featured in a public relations and fund-raising campaign that cleverly combined children and animals. One of those children whose defective circulation was corrected by the Potts procedure in a series of operations during the 1950s and 1960s told me that Dr. Potts liked to have photographs taken of the children with this friendly golden retriever (telephone interview with Lynn Adrian, September 26, 1997). See one of these photos in the hospital's "Campaign Report" (Issue 5, November 1997, p. 1).

FOR SUBSEQUENT BREAKTHROUGHS, the public's new expectations of medical miracles engineered at laboratory benches came to shape the actions of scientists, physicians, and journalists. In the United States, the most important such episodes before the turn of the century were testicular extract (1889), tuberculin (1890), diphtheria antitoxin (1894), and the X-ray (1896).<sup>87</sup> A quick glance at the first two will help confirm the continuity of patterns established in the rabies-cure enthusiasm. Self-rejuvenation with testicular extracts was announced on June 1, 1889, by Charles-Edouard Brown-Séguard in Paris. An English translation of his complete paper was published in the United States in early August.<sup>88</sup> Injecting a liquid extracted from the testicles of freshly killed guinea pigs and dogs caught the public's fancy not only for the sexual element but also because the elderly Brown-Séguard had done the rejuvenation experiments on himself.<sup>89</sup> Coverage of this discovery in

<sup>87</sup> There is no scholarly consensus on such a listing, but these four have been mentioned by historians. As indicated above, rabies vaccine has been omitted from most such lists. I believe that further research might reveal several other discoveries of this era as publicly recognized breakthroughs: thyroid-extract therapy, adrenalin, tetanus antitoxin, and brain surgery. Sadly, a list of breakthroughs cannot include the discovery of silver-nitrate drops to prevent infant blindness (C. S. F. Crédé's prophylaxis of 1883), despite its regular appearance in histories of medical discovery. This simple, cheap, and effective procedure was under appreciated, neglected, and even opposed by physicians for decades until a campaign of education and public relations led by lay organizations forced its use on the medical profession. Bert Hansen, "What Perpetuates a Preventable Disease? Infant Blindness Prophylaxis in the United States from 1880 to 1940," presented at a meeting of the American Association for the History of Medicine, May 1988. On the X-ray, see Nancy Knight, "The New Light': X Rays and Medical Futurism," in *Imagining Tomorrow: History, Technology, and the American Future*, Joseph J. Corn, ed. (Cambridge, Mass., 1986), 10–34; Beverly Robertson, "The Medical Significance of X-Rays as Seen in the Contemporary Popular Media from January to April 1896" (unpublished graduate course paper, History Department, New York University, 1988); J. T. H. Connor, "The Adoption and Effects of X-Rays in Ontario," *Ontario History* 79 (March 1987): 92–107; and Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New Brunswick, N.J., 1997), chaps. 1–2. The X-ray is the first in this series of breakthroughs to be mentioned in Frank Luther Mott, *A History of American Magazines*, 5 vols. (Cambridge, Mass., 1938–68), see "Medical Progress," 4: 310–12. After the turn of the century, another important therapeutic breakthrough was the introduction of Salvarsan for treating syphilis in 1910; see Pat Spain Ward, "The American Reception of Salvarsan," *Journal of the History of Medicine* 36 (1981): 44–62; and Ziporyn, *Disease in the Popular American Press*, which draws primarily on magazines, using stories in the dailies to a limited extent.

<sup>88</sup> *Scientific American* (August 10, 1889), supplement. Brown-Séguard (1817–1894) was an experimental physiologist, internationally famous for discoveries in neurology and endocrinology, the successor to Claude Bernard as professor of medicine at the Collège de France since 1878, and a member of the French Academy of Sciences since 1886. At several points in his career (the 1850s, 1860s, and 1870s), he had taught and practiced medicine in the United States. Although he was a British subject by birth, his father, Charles Edward Brown, was an American naval officer, and his mother, Charlotte Séguard, was French. The richest account of the scientific and medical literature on this topic is Merriley Borell, "Brown-Séguard's Organotherapy and Its Appearance in America at the End of the Nineteenth Century," *Bulletin of the History of Medicine* 50 (1976): 309–20; Borell does not, however, include anything about articles in general newspapers or magazines. On the science, see also J. M. D. Olmsted, *Charles-Edouard Brown-Séguard: A Nineteenth Century Neurologist and Endocrinologist* (Baltimore, Md., 1946), 205–39; and Michael J. Aminoff, *Brown-Séguard: A Visionary of Science* (New York, 1993), 163–73.

<sup>89</sup> An editorial in *Scientific American* directs readers to its supplement containing the full text of Brown-Séguard's paper and quietly acknowledges the comic side of public interest: "Whatever may prove to be the ultimate value of the doctor's discovery, his present paper will be read with much interest, and the results of further practice with the new treatment will be eagerly looked for by the public. The number of elderly people who are anxious to be made young and happy again is almost countless, and there is likely to be an epidemic desire among them to try the new medicine. A golden harvest seems to be in view for the doctors" (August 10, 1889): 80. The September 1889 issue of the *North American Review* carried an eight-page article, "The Elixir of Life" by William A. Hammond (pp. 257–64).

American newspapers and magazines was less substantial and sustained than that of the rabies announcement, perhaps because no fatal disease was to be cured with this treatment. Additionally, enthusiasm may have been weakened by some American attempts to replicate this “therapy” that seem to have caused at least two deaths within the first three months.<sup>90</sup> Still, there must have developed considerable popular awareness within a very short time since at least two different cartoonists and a songwriter presumed a reference to the Brown-Séquard “elixir” would be readily understood. Less than a month after the American translation of the scientific report appeared, *Puck* was already exploiting the titillation of this discovery to make fun of a questionable government policy. It ran a brightly colored, double-page cartoon, “It Beats Brown-Séquard.—Tanner’s Infallible Elixir of Life, for Pension-Grabbers Only.” James Tanner, the commissioner of pensions, is shown with a large syringe injecting dollar coins into the pockets of tired and lame veterans, who use the entrance for “physical wrecks” to apply for higher ratings. Those treated drop their crutches and dance happily toward the exit.<sup>91</sup> Also published before the end of 1889 was “Brown-Sequard’s Elixir: The Greatest Comic Song of the Day.”<sup>92</sup>

In the fall of 1890, after Robert Koch announced his tuberculin lymph as the first effective cure for consumption, the single greatest killer of the age, he was pictured as a holy conqueror, a heroic St. George. Within a few months, however, this therapy was judged a failure, and the enthusiasm among doctors and the public rapidly evaporated, though not before it had captured press coverage and headlines to rival or perhaps even surpass Pasteur’s rabies triumph five years earlier. For the few months until the therapeutic claims collapsed, tuberculin treatment enchanted reporters, artists, cartoonists, photographers, and editors, along with physicians, patients, and the wider public.<sup>93</sup>

<sup>90</sup> See “Another Victim of the Elixir,” *New York Times* (September 3, 1889): 1.

<sup>91</sup> *Puck* (August 28, 1889): 8–9. *Puck*’s rival, *Judge*, also published a political satire invoking Brown-Séquard. It was called “Hopeless Cases,” and showed “Dr. Brown-Sequard Randall” with “Free Trade” and the “Tammany Tiger” (August 31, 1889): 336–37. These were not the first instances of a political cartoonist finding “elixir of life” a powerful image. Much earlier, Thomas Nast had drawn Abraham Lincoln as a physician at a Negro’s bedside, holding a bowl labeled Emancipation for him to drink. “Doctor Lincoln’s New Elixir of Life—For the Southern States,” *New York Illustrated News* (April 12, 1862): 368, reprinted in Helfand, *Medicine and Pharmacy in American Political Prints*, 61.

<sup>92</sup> Words and music by J. Winchell Forbes, copyrighted in 1889, and published in Cincinnati and Chicago. It offered six verses (treating the elixir as a general restorer of youth in both energy and appearance), with this refrain: “The Latest sensation’s the Sequard Elixir / That’s making young kids of the wither’d and gray / There’ll be no more pills, or big doctor bills / Or planting of people in church yard clay.” I am grateful to William H. Helfand for providing me a photocopy of this item in his medical ephemera collection. Of course, the music sheet itself provides no evidence of its circulation or popularity, despite claimed status as “the greatest.” I have not found any entries for this song or its composer in basic reference works on popular music.

<sup>93</sup> Leibowitz, “Scientific Failure.” On Koch’s reputation in America, see also Russell C. Maulitz, “Robert Koch and American Medicine,” *Annals of Internal Medicine* 97 (1982): 761–66, which, however, does not deal with the tuberculin episode. A recent article on the attempted introduction of tuberculin therapy examined only the medical literature with no attention to newspaper coverage; see Donald S. Burke, “Of Postulates and Peccadilloes: Robert Koch and Vaccine (Tuberculin) Therapy for Tuberculosis,” *Vaccine* 11, no. 8 (1993): 795–804. There are relevant sections in a few recent books (though none focuses on public reaction, and Caldwell’s account of newspaper coverage is sometimes faulty): Brock, *Robert Koch*; Mark Caldwell, *The Last Crusade: The War on Consumption, 1862–1954* (New York, 1988); and Georgina D. Feldberg, *Disease and Class: Tuberculosis and the Shaping of Modern North American Society* (New Brunswick, N.J., 1995).



The initial announcement, at a medical congress in August, generated professional excitement but no substantial news coverage in the United States. Then in mid-November, an article by Koch captured the headlines, and the news spread rapidly. On November 15, the *New York Times* printed on its front page a translation of the entire article, "Further Communication Regarding a Remedy for Tuberculosis," that had appeared in the *Deutsche medizinische Wochenschrift* on November 14 and been cabled exclusively to the *Times*, so it claimed. (In England, a translation of the article was also printed in the *British Medical Journal* on November 15.) Physicians instantly made efforts to learn how to duplicate the procedures to provide treatment to Americans at home. According to the *New York World* (November 20), "there is great rivalry among the doctors of the city and Brooklyn to be the first to get information from Dr. Koch." The next day's *World* reported that several New York physicians, planning to open a sanitarium, were already en route to Berlin. Two days later, the *World* reported on the front page that "Dr. F. C. Husson, Consulting Surgeon at the [New York] Pasteur Institute, sailed on the Normandie yesterday en route to Berlin. He will at once go into the laboratory of Dr. Koch and study . . . the new method of curing consumption by inoculations." Husson planned to buy the appropriate instruments immediately on arrival in Berlin and send them back so that they would have arrived in New York before his scheduled return in mid-January, enabling him to begin treating patients without delay.<sup>94</sup> Within two months, New York had not only a Pasteur Institute but a Koch Institute as well: on East Broadway under the direction of a Dr. Aaronson and built to accommodate forty patients.<sup>95</sup>

Within days of the first newspaper article, a number of desperate patients were on steamers to Europe to secure the miracle cure in Berlin. On November 20, the *Herald* was already warning American patients to stay home because of crowds and a shortage of lymph in Berlin. This did not stop *Frank Leslie's Illustrated Newspaper* from raising funds to send a patient to Berlin for the new therapy; it then published exclusive drawings of this patient being treated.<sup>96</sup> Among the pictorial magazines, *Harper's Weekly* jumped in quickly on November 29 with a portrait of Koch;<sup>97</sup> *Scientific American* followed on December 6 with the same image but added an action shot, "Dr. Koch at Work in His Laboratory."<sup>98</sup> The next week, *Frank Leslie's* ran the same "action shot."<sup>99</sup> The political cartoonists did not lag behind the surge of passion for injections of lymph. Even a few days ahead of the *Frank Leslie's* drawing, *Puck* ran a full-color caricature, "A Bad Case of Consumption—Blaine

<sup>94</sup> *New York World* (November 20, 1890): 3; "A New Student for Dr. Koch," *New York World* (November 23, 1890): 1. This small item was appended to a three-column article, "A Talk with Dr. Koch: The *World* Correspondent Has a Conversation with Him." The director of the New York Pasteur Institute, Paul Gibier, addressed a general audience with an early statement about Koch's discovery in the *North American Review* 151 (December 1890): 726–31.

<sup>95</sup> Leibowitz, "Scientific Failure," 46, citing the *New York Herald* (February 12, 1891): 21.

<sup>96</sup> Reprinted in Leibowitz, "Scientific Failure," 44.

<sup>97</sup> *Harper's Weekly* (November 29, 1890): 932, with an article on 934, "Dr. Koch and His Great Work," by Amos W. Wright.

<sup>98</sup> "Cure of Consumption—An Interview with Professor Koch by Dr. Charles Hacks in *L'Illustration*," *Scientific American* 63 (December 6, 1890): 358–59.

<sup>99</sup> "Dr. Koch in His Laboratory," *Frank Leslie's Illustrated Newspaper* (December 13, 1890), reprinted in David L. Cowen and William H. Helfand, *Pharmacy: An Illustrated History* (New York, 1990), 131.

Tries an Injection of Reciprocity Lymph," in which a sick Republican elephant is about to receive an injection from Secretary of State James G. Blaine.<sup>100</sup> This optimism lost steam when clinical reports began to show that tuberculin rarely helped the patients and often made them worse. But, until then, the media enthusiasm followed much of the pattern set by the rabies episode, except for having a greater involvement of physicians, a higher level of enthusiasm, and no dogs in sight. The collapse of Koch's exaggerated claims embarrassed the media to some extent, and all participants seemed to realize that this was a setback to expectations about miraculous cures.

BY 1890, THE NEW PATTERN OF RECURRING BREAKTHROUGHS was so firmly established that jokes could be made about them as a group, as in these doggerel verses that appeared in December of that year:

First they pumped him full of virus from some mediocre cow,  
Lest the small-pox might assail him and leave pit-marks on his brow;  
Then one day a bull-dog bit him—he was gunning down at Quoque—  
And they filled his veins in Paris with an extract of mad-dog;  
Then he caught tuberculosis, so they took him to Berlin,  
And injected half a gallon of bacillae into him . . .  
But his blood was so diluted by the remedies he'd taken  
That one day he laid him down and died, and never did awaken:  
With the Brown-Sequard elixir though they tried resuscitation,  
He never showed a symptom of reviving animation;  
Yet his doctor still could save him, (he persistently maintains,)  
If he only could inject a little life into his veins.<sup>101</sup>

Four years later, when serum therapy for children dying from diphtheria was announced, a wariness based on the pain of Koch's tuberculin failure affected all presentations of the breakthrough. But caution could only shape, not suppress, the widespread excitement for this miracle cure. At the start of the episode, the laboratory researchers, the public health physicians, and the journalists all undertook to convince the public (and perhaps themselves) that this new cure was certain, that it had been tested, and that its potency had been objectively confirmed—in short, that it was not like the unsupported claims made by Koch in 1890. Just like the earlier rabies vaccine, diphtheria antitoxin was the product of European laboratory research; it was, again, a procedure that utilized immune responses to work a therapeutic effect. And, as with the hydrophobia virus, the therapeutic substance was manufactured in animals' bodies, then extracted by medical scientists

<sup>100</sup> Reprinted in Leibowitz, "Scientific Failure."

<sup>101</sup> "E. Frank Lintaber," *Puck* (December 17, 1890): 288. Twelve omitted lines cover typhoid fever, rattlesnake bite, leprosy, and dyspepsia. "Lintaber" struck me as an odd-sounding name, with E. Franklin Taber as a likely alternative. A book by Edward Franklin Taber, *Returned with Thanks, and Other Poems* (Patchogue, N.Y., 1899), is listed in the National Union Catalogue with E. Frank Lintaber added parenthetically. The *Reader's Guide to Periodical Literature* lists only one entry (under either name), a poem by Lintaber in *Harper's Weekly* (June 15, 1901): 610.

in laboratories and injected by clinicians into children facing a life-threatening disease.<sup>102</sup>

These clear echoes of the first medical breakthrough show that the 1885 Pasteur sensation continued to have an impact in shaping responses to advances. Yet the patterns of expectation, enthusiasm, and meaning that it pioneered would gradually change as successive new discoveries each came to take center stage. Attention-grabbing discoveries became ever more frequent and eventually routine. Losing its novelty, the medical breakthrough was transformed into an expected occurrence. By the twentieth century, a radically new medical therapy was no longer a surprise, nor always a sensation, and never again a once-in-a-lifetime event.

<sup>102</sup> A recent article by Paul Weindling tells the international scientific story and cites further literature; see "From Medical Research to Clinical Practice: Serum Therapy for Diphtheria in the 1890s," in *Medical Innovation*, J. Pickstone, ed. (London, 1992). On the importance of the press and the public in America, see Howson, "‘Sure Cure for Diphtheria’"; Hammonds, "Search for Perfect Control"; and Fee and Hammonds, "Science, Politics, and the Art of Persuasion." Leibowitz, "Scientific Failure," discusses some news coverage about the diphtheria antitoxin to demonstrate the press's strong memory of the tuberculin failure. Ziporyn, *Disease in the Popular American Press*, is also useful.

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