

Copyright © 1999 The Johns Hopkins University Press. All rights reserved.

Bulletin of the History of Medicine 73.4 (1999) 629-678

[Muse](#) [Search](#) [Journals](#) [This Journal](#) [Contents](#)

Access provided by UCLA Library

New Images of a New Medicine: Visual Evidence for the Widespread Popularity of Therapeutic Discoveries in America after 1885

[Bert Hansen](#) *

[Figures](#)

It was only during the closing decades of the last century that America's daily newspapers and weekly magazines began to give high visibility to medical discoveries. But these first episodes of widespread news coverage quickly prompted significant public interest and enthusiasm for major therapeutic achievements, and they initiated a pattern of proclaiming medical breakthroughs in the media that continues to the present. While only some of these new therapies maintained their status as true medical advances in the long run, each--in its moment of celebrity--garnered headlines and achieved popular notoriety. This wide acclaim stands in contrast to the minimal, muted, and mixed receptions granted in earlier decades of the nineteenth century to advances that scholars have usually regarded as significant: the stethoscope, anesthesia, antisepsis, and the identification of microbial agents of disease. **[End Page 629]**

In certain cases, advances of limited value, such as rabies vaccine (1885) and organotherapy (1889), captured people's imagination and enthusiasm; in others, such as the introduction of diphtheria antitoxin (1894) and the X ray (1896), an initial renown was sustained in both popular consciousness and the annals of medical history. The prominence of these four, along with tuberculin therapy in 1890, helped to establish in mass culture two new intertwined notions: "medicine is scientific" and "medicine makes progress." Regarding the general public's notion of therapeutic progress, it may be noted that while no single event or single date can mark the "transition from a largely ineffective to a largely beneficial era of clinical medicine," participants in a recent symposium on the famous question "When did a random patient benefit from a random physician?" generally favored a traditional dating of this watershed to around 1910, or even later. ¹ It seems, then, that an imagery of effective, science-based therapies entered the circulation of mass culture some years ahead of the objective transformations that

historians usually emphasize.

Breakthroughs as a Source of New Images and Attitudes

Popular attitudes about medicine changed significantly because of the publicized series of discoveries that started in 1885. This study makes the pictures and portrayals of those breakthroughs its subject while acknowledging that images are only part of the story, if an essential one. Several factors justify examining this graphic imagery. First, the pictures demonstrate the widespread attention garnered rapidly by some medical novelties far beyond the confines of the profession. Second, the appearance of these discoveries in political caricatures and joke cartoons of the era shows that they had become so familiar as to be used without explanation in nonmedical contexts. Third, this largely unexamined genre of nontechnical portrayals of medical advance suggests some possible feedback loops from ordinary citizens' concerns and enthusiasms to the social [End Page 630] status of the profession and to the willingness of elected officials and philanthropists to support expensive new institutions like the medical laboratory and the rapid growth of health departments and hospitals across the United States. Because I am focusing here primarily on pictorial coverage of breakthroughs, I will limit description of the science, the personalities, and other parts of the story to what is essential for understanding and appreciating the visual records.

The recent popularity of the word *breakthrough* (it seems to appear every few days in reports of medical news) highlights the public engagement with medical discoveries. These innovations (real or apparent) are seen as major advances by the public at large. The breakthroughs examined here were more than just laboratory discoveries, more than just reporting or coverage: they engendered wide familiarity and popular enthusiasm. A convergence of factors made Louis Pasteur's rabies cure the first medical breakthrough acclaimed in the United States. It remained front-page news for months all across the country, and the constant attention to the apparent miracle cure created in the laboratory helped to establish new iconography and new institutions. In the process, popular consciousness gained an entirely new idea that medical research could provide widespread benefits.

This new expectation about progress offered a challenge to the centuries-old understanding (shared by physicians and patients alike) that little ever changed in medicine. Even by the early 1880s--with important new studies under way in anatomy, physiology, cell biology, and bacteriology--medicine had seen very few successful therapeutic advances, and none that made a sensation in the press. Evidence of popular cynicism about the value of doctors and doctoring in this era of transition is widely available, but two brief jokes that appeared in *Judge*, a national magazine of political and social satire, neatly illustrate how long-standing pessimistic feelings were repackaged in the 1880s. In late 1885, readers were informed that "a doctor in Chicago became crazy by dosing himself with cocaine. The case is a rare one. It is to the credit of the intelligence of the medical profession that they do not often make the mistake of taking their own medicines." ² Early in 1886, *Judge* targeted the profession again, blending the criticism this time with antifeminist sentiments: "Five times as many ambitious women take to medicine as to law. This contradicts that generally-received idea of the sex that

they delight in scandals and quarrels, but abhor cruelty and killing." ³ But we must keep in mind that attitudes and actions need not be mutually consistent: this popular **[End Page 631]** pessimism seems not to have inhibited people's seeking out professional medical help when they were ill. Nor did it keep them and their physicians from having confidence that the treatments worked, as Charles Rosenberg has shown in his now-classic study of doctor-patient interaction and the meaning it held for participants. ⁴

Suddenly, in late 1885, the public was offered pictures in newspapers and magazines quite different from the routine scenes of bandaging, dosing, clystering, accidents, and epidemics--an entirely unprecedented depiction of spectacular medical advance. Almost overnight, the physician seemed to have become a miracle worker. This imagery of breakthroughs both tapped and stimulated the public's new fascination with medical novelties. ⁵

I am not claiming here that medicine entered popular culture only by means of the major episodes of frenzied, sensationalist coverage that centered on certain breakthroughs. Nor am I saying that science was absent from American medicine before 1885. For example, Robert Koch's identification of the cholera germ in 1884 was not ignored by the press, but it failed to provoke sustained headlines or a ripple effect in other media. ⁶ For several decades, scientific medicine had been a prominent goal and a partial achievement of some American practitioners and medical educators, as recent scholarship has made clear. ⁷ Further, while I endorse a colleague's cautions about historical work that tends "to see the emergence of laboratory medicine as the emergence of scientific **[End Page 632]** medicine," ⁸ my analysis below shows that popular attitudes in the decade surrounding 1890 exhibited exactly that conflation of ideas. Though that era's sense of the novelty of science in medicine may have been faulty history, it is possible to explore their picture of things without either making this picture our own or ignoring it as something naive and inaccurate. But by attending to the different pictures of medicine in the minds of three distinct groups (elite physicians, ordinary practitioners, and lay people), we will notice two important variations. First, rank-and-file physicians and the general public had far less engagement with the developments of science in medicine before the 1880s than did members of the European-trained medical elite. Second, when the science-based breakthroughs started appearing in the 1880s, the public usually raced ahead of the profession in embracing the novelties. ⁹ It is this initial wave of public enthusiasm that the present study illustrates and examines. **[End Page 633]**

If the medical breakthroughs of the 1880s and 1890s were planted by workers within medicine, they grew in the soil of new mass media and were aggressively promoted by those in journalism and publishing. The popular press has its own history, as does its changing use of illustrations. The images studied in this article did not arise by spontaneous generation, but were produced by the efforts and decisions of editors, artists, and publishers at a definite moment in the development of American print media: a stage often recognized simply as "the new journalism." For convenience and brevity the change may be dated from 1883, when Joseph Pulitzer purchased the *New York World*. His innovations were copied by William Gordon Bennett, Jr., in the *New York Herald*, and

by other papers, and then by Pulitzer's great rival William Randolph Hearst in the *San Francisco Examiner*. The readership and power of the daily press were greatly expanded by three important clusters of changes whose features are so familiar today that we can easily forget that newspapers lacked them before the closing decades of the nineteenth century. All three helped in creating popular enthusiasm for the medical breakthroughs studied here. That era saw, first, a transformation of the recently invented human-interest story into blaring sensationalism; second, the inception of various editorial novelties (including advocacy crusades, public fund-raising subscriptions, stunts, and interviews); and third, the introduction of new typesetting and printing technologies that offered unprecedented graphic capabilities. Pictures entered the American press on a daily basis in the *New York Daily Graphic*, founded in 1873 (but closed down in 1889 after other papers successfully adopted its visual strengths).

Popular graphic materials from the nineteenth century offer a great deal to historians, although they have not been used extensively by medical historians, who are often more at home with the professional journals of the era. Two particular utilities of this kind of evidence have been succinctly differentiated by John Kouwenhoven in his "graphic history" of New York: on the one hand, "pictures . . . are often the source of factual information about topography, manners, and customs which is available nowhere else. On the other, they are a clue to attitudes and interests, to blind spots and perceptions, of which there may be no other surviving evidence." ¹⁰ Both uses are found below, with emphasis on the second. **[End Page 634]**

In presenting these pictures, my intention is to take readers on a verbal walking tour of historic landmarks and their environs, while providing the background information and interpretation needed to observe the crucial features and to discern the meaning of these images in their original contexts. Readers may enjoy the remarkable freshness and humor of many of the graphics reproduced here, finding them worthy of interest in themselves, in addition to their service as documentation of mass culture a century ago.

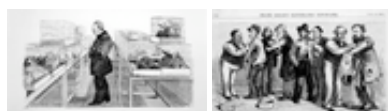
¹¹ In examining the images of breakthrough discoveries, my analysis emphasizes their audiences over their origins, their effects over their causes--pursuing what they can tell us about the thoughts and feelings of those who saw them in daily and weekly papers. I do not utilize them as "representations" (whether accurate or inaccurate) of the medical events, or as "illustrations" of a medical history narrative--though both are quite legitimate uses. They are more interesting, I believe, for what they can tell us about how ordinary people envisioned physicians, medical tools, and health-care institutions in an era of rapid change.

Looking for What Pictures Reveal



Five initial images will provide orientation for the tour that follows. First is an 1890 political caricature of Benjamin Harrison, who had been elected president two years earlier ([Fig. 1](#)). This cartoon is one in a long series of satirical attacks in which Benjamin's supposed deficiencies are indicated by his increasingly diminutive stature, as measured by the large top hat of his successful grandfather, William Henry Harrison, elected president in 1840. Our interest here is not in the Harrisons, but in the prominent microscope--which was apparently familiar in form and function to a mass audience,

even in an era when relatively few physicians had **[End Page 635] [Begin Page 637]** acquired the necessary skill or an interest in using this instrument. While only other kinds of historical sources can document the extent of microscope training within the profession, or the development of the instrument itself, this cartoon shows how nonmedical sources can demonstrate that a wide public had ready familiarity with this instrument in 1890--for without such familiarity the cartoon's point would be utterly lost. ¹² It is also significant that the slides visible on the table are not ones prepared for the mid-century medical sciences of histology or cellular pathology, but rather are examples of the latest popular fascination: Bacteria and Microbes.



A pair of images will carry this argument further and provide a methodological clarification. An 1884 newsmagazine engraving of Louis Pasteur among his caged rabbits ([Fig. 2](#)) seems immediately accessible and intelligible, and it has thus been a popular choice for reproduction in historical books and articles. It appears to take us directly into his laboratory--and as historians, we are delighted to be offered such access. Yet, for all its seeming transparency as a document, we would be hard put to know just what the readers of that time knew or thought about Pasteur's work. For historians, the picture may embody what we have already learned about his work from other sources, and it can thus be used by us to "illustrate" that information. But compare this image with another political cartoon of the same era, "The Democratic Doctors Attempting to Vaccinate Political Tramps in Congress" ([Fig. 3](#)): while this might seem at first less revealing than Pasteur-at-work, since we are not shown much detail of the medical instruments or technique, my point is that its goal of conveying a political message (not a medico-historical one) requires that the medical activity be immediately recognizable and familiar--perhaps even routine. From Pasteur and his rabbits we cannot tell whether readers knew what his experiments were about; but from the **[End Page 637]** vaccination picture, we can infer with some confidence that the artist and his editor assumed most readers to have already in their visual memories public vaccination campaigns, or depictions of them. ¹³ This political cartoon thus provides better evidence of a shared awareness than we could glean simply from a news engraving of a vaccination scene that presumes no prior familiarity with the subject. **[End Page 638]**



A second pair of contrasting images will complete our orientation and furnish a bridge to the first of the breakthroughs. Pasteur watching the youthful Jean Baptiste Jupille receive an injection of rabies vaccine is a lovely and widely reproduced image ([Fig. 4](#)). Jupille was the second known rabies victim under Pasteur's care, and the treatment took place in October 1885. ¹⁴ This picture was published in the United States several **[End Page 639]** times in November and December 1885. ¹⁵ As with Pasteur among the rabbits, historians have gravitated to this naturalistic representation, for it seems so real--even though, unless we find independent documentation, we cannot be sure how accurate it was. As a contrast, consider a **[End Page 640]** political cartoon of December 1885 showing *New York Tribune* publisher Whitelaw Reid being rushed to Paris for Pasteur's new treatment in "Another Patient for Pasteur" ([Fig. 5](#)). Reid was, of course, not in danger of succumbing to hydrophobia, and he never went to Paris for any treatment. The cartoon's point is a (complicated) political one, not of interest here; but for medical history, this cartoon provides more information

on its own than does the figure of Jupille's treatment. Even without ancillary documentation, it establishes firmly that the notion of a new rabies cure available in Paris was assumed to be widely current among the readership of *Puck*. And, as we shall see from other images below, ordinary Americans had more than an awareness, they shared an enormous enthusiasm. Rabies shots were "The Topic of the Day!"

Hydrophobia Cured: The First Medical Breakthrough

A treatment for dog-bite victims at risk for rabies was announced by Louis Pasteur in Paris in late 1885. Although his name was at that time not entirely unknown in America, he was hardly famous, and his contributions were appreciated at this time by only a small segment of elite physicians and scientists. (The process we call "pasteurization" was already being used in a limited fashion, but that word came to prominence only much later.) His method required that the victim of bites from a recognizably rabid animal be injected with a series of increasingly virulent extracts of partially attenuated infectious material over about twelve days, thereby gradually building up--according to Pasteur's thinking--an artificial resistance to the disease in advance of the natural infection from the bite. In late October he proclaimed the success of the treatments administered to Joseph Meister in July, and announced favorable progress in a more recent series of injections for Jean Baptiste Jupille. ¹⁶ Modern readers may be surprised that we know the identities of individual **[End Page 641] [Begin Page 643]** patients, but it was a characteristic of coverage then that personal stories were employed to increase the public's engagement with the news. Pasteur's announcement was reported in American newspapers, but these initial accounts were very brief, with little emphasis, and none were front-page stories. Pasteur, being a chemist, used physician collaborators and did not administer the injections himself; while the press accounts usually maintained an awareness of the distinction, he nevertheless came in time to be seen as the provider of this cure, not simply its discoverer. ¹⁷

Then, in early December, the Pasteur treatment suddenly became front-page news across the United States when four working-class children from Newark, New Jersey, were bitten by a stray dog. On 3 December, the day after they were bitten, a local physician urged that they be sent to Paris for the only treatment that could save their lives, and he called for donations from the public to cover their expenses. Tickets were secured for passage on a steamer sailing to Europe within a few days. Newspapers quickly promoted the fund-raising so successfully that when a millionaire industrialist offered to send them, his offer could be declined. As contributions arrived, the donors' names appeared in the daily papers. The press churned public interest with large and small stories about the boys' families, gifts of winter clothes for the ocean voyage, Pasteur's prior achievements, hydrophobia remedies of all sorts, municipalities' attempts at dog control, various physicians' opinions on hydrophobia, the theory of inoculation, the boys' "hospital" room on the ship, and the germ theory in general. Over the next four months, newspapers would also report at length on such topics as other countries' rabies patients being treated in Paris, American attempts to produce the vaccine, the death of a young girl in Paris after she had received the new treatment, and an international campaign for funds to create a treatment center in Paris, which would ultimately open in November 1888 as the Pasteur Institute.

The coverage was not only varied, it was extensive. For the first two months, a news article appeared almost every day in each of the New York papers, with as many as four (and occasionally more) in the same paper on certain days--in addition to editorials, readers' letters, and comic items. At least twice, the *New York Herald* used more than 10 percent of its space for rabies and its cure. In December alone, the *Herald* (admittedly the leader in rabies news) published 17 editorials, 31 letters to the editor, **[End Page 643]** 17 cable dispatches from Paris or London, and 73 news articles. In January, the *Herald* printed 98 different items. Slightly less numerous were *New York Times* articles, with 70 items on some aspect of the rabies story before the end of February. Nor were reports on the rabies discovery and the related American adventures limited to the New York and Newark papers: the Newark boys' adventures were reported in big-city and small-town papers all over the country.

Thanks to the recently reconnected Atlantic cable, Americans could read daily dispatches from Paris. Even before the boys reached Europe, an American newspaperman had interviewed Pasteur. When they arrived, the correspondent accompanied them to the first treatment and cabled back a full report, pumping up the historic event with solemn details and inserting the comic relief of a child's more limited perspective on this great moment:

At exactly twelve minutes before seven the Doctor inserted the point of a silver needle beneath the skin . . . 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." [18](#)

Newspaper readers across the United States were treated to hundreds of further reports from abroad of the daily injections, more interviews with Pasteur and his colleagues, the boys' antics in their hotel, the Christmas gifts they received, and their departure for home.

While the boys were still on their return voyage, their miracle cure was immortalized in a new exhibit at New York's Eden Musée, a very popular wax museum: "The Topic of the Day, Monsieur Pasteur Operating on One of the Newark Children." [19](#) But the boys themselves became celebrities too--whether because they were drawn back from the jaws of death, or just because they had been in the news and had been touched by the great chemist, is not clear--and thousands paid to see them onstage in the working-class entertainment venues known then as dime museums. For weeks they told their story to overflow crowds in New York, Philadelphia, and possibly other cities.

American enthusiasm for the new rabies cure was not, however, limited to a trivial fascination with passing celebrity: some Americans also recognized the necessity of being able to produce the new biological reagent on this side of the Atlantic if patients were to be treated in time, and in several cities physicians and entrepreneurs gathered to imitate **[End Page 644]** Pasteur's work. [20](#) Dogs bitten by the Newark stray were quarantined for observation by a group of local physicians, and rabbits were inoculated

with matter from the dog that had bitten them and the children. Before the end of December, groups in New York and in St. Louis were pursuing corporate status under the (unauthorized) name of Pasteur Institute. These efforts preceded Pasteur's own call for such an endeavor by more than two months. His institute in Paris was to open only in 1888, but it would flourish; the initial American efforts had far less success. Nonetheless, they started a movement toward the creation of new institutions to undertake laboratory research and offer the public up-to-date treatments. Over the next twenty years, the name "Pasteur Institute" was used by several American institutions in Ann Arbor, Baltimore, Chicago, New York, Pittsburgh, and perhaps Philadelphia. [21](#)



Illustrations were a crucial element in the flood of newspaper and magazine articles creating the rabies cure sensation, and they made certain aspects much more memorable. Often humorous, they deepened people's engagement with the story; sometimes, as in the case of political cartoons (like [Fig. 5](#), earlier), they took advantage of its familiarity to make other arguments. Examples of high-quality news drawings reprinted from European magazines are seen in Figures [2](#) and [4](#) above; they are elegant and dignified images, in contrast to the hurried sketches assembled by American artists when the unanticipated and entirely unprecedented story broke in early December. Typical of the impromptu efforts are the postage-stamp-sized images that accompanied "The Children's Farewell" ([Fig. 6](#)), a two-column article in Joseph Pulitzer's *New York World* on 10 December 1885. Small images like these were the norm in the newspapers of that era, which had not yet adequately solved the technical problem of holding together a page of type in which **[End Page 645] [Begin Page 647]** something crossed the rigid boundaries of the column rules. Despite their minute size and generalized character, these pictures nicely convey what was offered to satisfy the public's curiosity: the children boarding the ship, the stateroom converted into a dormitory (labeled "The Steamer's Hospital" despite the fact that all four were in good health), portraits of the four boys, a head-shot of Dr. Pasteur, and a full-length figure of Dr. Frank Seaver Billings (who accompanied the boys to Paris) in top hat with cane. The boys' pictures in the *World* were probably copied from the *Sun*'s four portraits printed two days earlier, and the image of Pasteur is not a good likeness (the *New York Evening Post* caustically suggested that this was simply the face of a local politician relabeled to fill a sudden need). Our interest is not in judging the accuracy of the illustrations or settling the priority disputes, but in noticing how images and comments about them added momentum to the tidal wave of this sensation. [22](#)



In less than two weeks there had been so much attention to this novelty that satirists could make it a target. Their whimsy did not puncture the balloon of excitement, but inflated it further. A large cartoon, "The Pasteur Boom: High Times for Hydrophobists," with its central image captioned, "Now Is the Time to Get Bitten by a Rabid Dog and Take a Trip to Paris" (see [Fig. 7](#)), makes light of the masses' enthusiasm for the trip, without challenging its importance to the four little boys and without taking a stand on the value of Pasteur's new therapy. Indicative of how the press was feeding upon itself in the creation of news is the fact that when this cartoon arrived in Europe by steamer a few weeks later, it was shown to Pasteur by the *New York Herald's* correspondent, who then cabled a report of Pasteur's comments across the Atlantic in time to make the next morning's papers in New York. This cartoon also mocks the

fashion of ladies' lap dogs and the traditional policeman's role as urban dog killer.



Taking a different tack, a cartoonist at the *New York Daily Graphic* adapted the traditional scene of a daughter buying her father's beer to the new passion for getting some of Pasteur's life-saving virus, as one of ten jokes covering its entire front page ([Fig. 8](#)). That the ribbing is gentle **[End Page 647]** and aimed at popular enthusiasms rather than at the medical innovation is indicated by a long story in the same newspaper two weeks later on "Pasteur's Methods in America," which includes drawings of "The Newark Scientists" and "The Recent Experiments for the Cure of Hydrophobia." [23](#)

It seems that in a matter of just a few weeks, the general public had assimilated the announcement of a new life-saving discovery, had learned that the curative extract was produced in the bodies of rabbits that were then sacrificed, had faced the puzzling idea that the same virus that killed so brutally could be modified to have fabulous healing power, and had become excited at the prospect that these new ideas and techniques would be transforming the routines of medicine and medical education. This heady moment of rapid change was captured by *Puck* in a cartoon of six frames under the double entendre, "The Profession Gone Mad": scenes show the traditional anatomist's skeleton cast aside in the medical lecture room, replaced by a box labeled "VIRUS"; medical students **[End Page 648] [Begin Page 650]** engaged in "cat-snatching instead of body-snatching"; medical-school demonstrators performing trephination on a live rabbit; physicians swarming to get a look at a case of rabies, the newly fashionable disease; and a physician apologizing at a patient's bedside, "Excuse me, but I have an experiment to make." [24](#)



But Pasteur's protective inoculation for rabies reached the pinnacle of visibility in American graphic imagery in mid-February, when one of America's leading artists, T. Bernhard Gillam, turned President Grover Cleveland into Louis Pasteur within a satirical setting that placed him in the very center of the cartoon. Gillam drew "Pasteur Cleveland" just below the *New York World's* Joseph Pulitzer (portrayed as Lady Liberty) and just above Jake Sharp (an entrepreneur who had gained approval to build a street railway on Broadway by bribing the aldermen, but was then arrested, convicted, and later released on appeal) trimming the claws of the Tammany Tiger ([Fig. 9](#)). In this densely populated cartoon, Gillam employed the device of fashioning about twenty-five of his political targets into wax museum figures. [25](#) Interestingly, he used the name of New York's Eden Musée, where, indeed, a new display featured "Pasteur Operating on One of the Newark Children." This wax-figure group was described in the Eden Musée's printed catalog in terms that illustrate how profoundly Pasteur's work was changing ordinary people's expectations about medical progress:

Of late M. Pasteur's name has become a *household word* in every country on account of his experiments in trying to prevent the dreadful effects of the bite of mad dogs, by inoculating the victims with the virus of the rabid animal. . . . Patients from all parts of the world have flocked to his laboratory to undergo the new process. [26](#)

Expectations about the nature and meaning of a medical breakthrough were firmly planted in mass culture during the winter of 1885-86, when Pasteur's name became "a household word" and changed the thinking of newsmen, medical leaders, and the general public alike. Many features of the pattern continued for a few decades, evolving gradually as new discoveries took center stage in turn, and as the frequency **[End Page 650] [Begin Page 652]** of discoveries increased. Portrayals of subsequent episodes show how the springing up of medical novelties was becoming a routine phenomenon, and they reveal how quickly the political cartoonists could tap into popular awareness of a discovery. Like the rabies cure, the next two major breakthroughs, organotherapy and tuberculin, were European discoveries, with American physicians involved only secondarily. The diphtheria antitoxin and the X ray, following shortly thereafter, were innovations in which American physicians, scientists, and health administrators played more active roles.

Organotherapy Makes the Headlines

When the multinational physician and physiologist Charles-Édouard Brown-Séquard announced in early June 1889 that he had succeeded in effecting rejuvenation by injections of testicular extracts from animals, many aspects of the story captured widespread interest--not the least of which was that this elderly physician had tested the extracts on himself. ²⁷ The research also tapped popular curiosity about sex, masculinity, aging, and the use of animal extracts in humans. Brown-Séquard was then seventy-two years old, a member of the French Academy of Sciences, and successor to Claude Bernard as professor of medicine at the Collège de France--at the peak of a rather peripatetic career in which he had practiced medicine, taught in medical schools, and performed research in Boston, London, New York, Nice, Paris, Philadelphia, and Richmond, Virginia. Press coverage of his new technique in the United States was sporadic until the complete text of his paper appeared in English translation in the *Scientific American Supplement* for 10 August 1889. ²⁸ The news coverage then swelled, and it would unfortunately come to include two **[End Page 652]** reports of fatal outcomes at the hands of American physicians trying to replicate the experimental treatment. ²⁹ The weekly *Frank Leslie's Illustrated Newspaper* headlined its report "An Astonishing Medical Discovery"; citing American experiments by former U.S. Army Surgeon-General William A. Hammond, this article claimed that "the result of the application to several old gentlemen has been to renew their vital energies to a noticeable extent, and to give them an invigoration that was sensibly felt." ³⁰ Hammond published medical articles about his own research with testicular extracts, and also disseminated his findings to a much broader public in the *North American Review*. ³¹



But beyond these magazine stories, the most striking evidence of the therapy's hold on the popular imagination comes from songs, comic poems, satires, and its use in political caricature. Even before the end of August, the two leading magazines of political and social commentary had both employed the apparently well-known words Brown-Séquard's Elixir of Life in full-color, double-page centerfold cartoons about national politics (Figs. ¹⁰ and ¹¹). "Elixir of Life" was not a new phrase: it had an established use among patent-medicine

makers, and it had even appeared in political cartoons before--but a therapy that used piston syringes and hollow needles to inject tired men with juice from sexual organs gave the old alchemical term a comic new lease on life. Risqué jokes were irresistible. Louis Dalrymple at *Puck* (a magazine of Democratic leanings) fashioned organotherapy into a lively attack on the Republican administration's new pension policy by which Commissioner of Pensions James Tanner had proposed using a government surplus to expand pension benefits for Civil War veterans and their relatives (see [fig. 10](#)). Like the other political cartoons that used medical-breakthrough imagery, "It Beats Brown-Séquard" is less interesting today for its role in partisan wrangling than for the evidence it provides of the public's fascination with the latest headline innovation.

Brown-Séquard's American notoriety is further confirmed by Grant Hamilton's "Hopeless Cases" in the Republican-inclined weekly, *Judge* **[End Page 653]** ([Fig. 11](#)). Here the Brown-Séquard figure is Samuel Jackson Randall, a Democratic congressman from Pennsylvania, who had lost President Cleveland's favor two years earlier; he had been a protectionist since the 1860s, despite that position's being unpopular in his party. Here he is well supplied with two large tanks of "Protectionism" as an "Elixir of Life"--but it is too late, he says, for this rejuvenation juice to revive the Democratic Party and its debilitated Free Trade policy. This up-to-date physician declares: "Take them away! They're too near dead for treatment." [32](#) **[End Page 654]**

These two political cartoons are interesting as well for their crude, but recognizable, depictions of the hypodermic needle and syringe, which was not yet a commonly pictured device, either realistically or exaggerated for comic effect. As will be seen below, when the hypodermic reappears the following year in connection with Koch's tuberculin, it is portrayed more accurately (if still humorously enlarged). With respect to changes in medical iconography more generally, it may also be noted that the seated figure was recognizable as a physician in 1889 by his medication bottle and syringe--not yet by a white lab coat, thermometer, or stethoscope, for these were still in the future for popular imagery.

Whether or not partisan cartoonists and their readers deemed the new organotherapy effective, such images signal widespread familiarity with the latest medical breakthrough. In fact, by mid-October, there had been so much excitement among the lay public that *Scientific American* felt it necessary to defend Brown-Séquard's character and his work against distortions and exaggerations in the popular press. [33](#) Another indication **[End Page 655]** of just how quickly and widely the excitement spread is offered by a historian's claim that by the end of 1890 "more than twelve thousand physicians were administering the extract to their patients." [34](#) The kind of sudden, radical advance that had long been unimaginable in medicine was now coming to be seen as expected, and almost routine.

Koch's Consumption Cure: Tuberculin Therapy

Just about a year after the testicular-extract sensation, another European scientist captured American headlines, this time with a cure for tuberculosis. It would be hard to imagine a more significant or gratifying breakthrough, and for a while the frenzy of the press's and the public's shared enthusiasm knew no bounds. Not only was this a disease

whose morbidity and mortality dwarfed that of rabies by many orders of magnitude, its cure was at the hands of the great physician Robert Koch, whose discoveries about the etiologic agents of anthrax, cholera, and tuberculosis had already carried him to the pinnacle of professional recognition internationally. If his name had not yet become the "household word" that Pasteur's was, it was to acquire that status in a flash. The excitement blossomed so quickly that it put the attention accorded Pasteur five years earlier into a shadow. If Pasteur was an experimentalist hero and a kindly gentleman who fussed over the children arriving for treatment, Koch was a St. George slaying the dragon of monstrous disease. ³⁵ Unfortunately for Koch and for the world, his tuberculin therapy was shown within several weeks to lack effectiveness and even to be harmful in some cases. Because the rise and fall of tuberculin as a therapy have been recounted by others, only its visual presence in the mass media is examined here. ³⁶

For a few months the media, the public, and the profession in America were captivated by what seemed to be laboratory medicine's crowning **[End Page 656]** achievement. On 15 November 1890, the front page of the *New York Times* carried a translation of Koch's complete text from the *Deutsche medizinische Wochenschrift* of 14 November (received by cable). But this was not a big-city story only: we can look, for example, to the coverage in Connecticut's *Danbury Evening News* (a paper appearing five times a week in a small city with fewer than three thousand listed taxpayers in 1885) to illustrate the nature of the public's interest, and to reveal as well the intense competition among cities and medical institutions to be pioneers, receiving national publicity for their participation in this breakthrough. ³⁷ The following summary highlights important themes and key events in the Danbury articles, without attempting to capture all the coverage or the depth of the stories:

15 November: The University of Pennsylvania is sending a physician to Berlin.

18 November: Boston will have a Koch Institute.

22 November: "Will It Cure Cancer, Too? Professor Koch Looking for More Diseases to Conquer." (The article includes a small portrait of Koch.)

22 November: Pasteur sends Koch congratulations and is sent a vial of the lymph.

4 December: New Haven receives a small portion of the lymph. "It is believed that the lymph is the first received and injected in America."

5 December: Lymph is used in New Haven and its effects described.

9 December: More tuberculin is received in New Haven. **[End Page 657]**

11 December: Danbury expects some next week, and the lymph is used in New York by Dr. Jacobi at Mount Sinai Hospital.

12 December: A Paris physician prevents its use at the Bichat Hospital.

15 December: "Koch's Lymph at the Capital" (its use in Washington) and "Secrecy at Johns Hopkins" (physicians not revealing initial reactions of fourteen treated patients).

18 December: The first Philadelphia injections.

19 December: Lymph is expected in Danbury.

30 December: The patients at Johns Hopkins are doing well.

12 January: The return of a New York physician from Berlin with two bottles of lymph that he will use, but not on advanced patients.

15 January: "The Lymph Curing Lupus" at City Hospital in Worcester, Massachusetts.

16 January: "Koch's Cure Described: The Discoverer Tells the World All About It. Several Criticisms Answered. . . . While It Is Young, Yet Many Cures Have Resulted."

22 January: "Lymph for the President" (President Harrison receives from the U.S. minister at Berlin five vials that are being distributed to hospitals in Washington, D.C., Chicago, Indianapolis, and New Orleans).

Reflecting on the previous winter's media coverage, the pioneering Chicago surgeon Nicholas Senn observed that "for days and weeks the public press devoted a liberal space to telegraphic messages, to editorials and messages from medical men, relative to the new treatment"; he then claimed (with some embarrassment) that "no other event in the world's history ever attracted so much attention and no discovery in medicine and surgery ever found such ready introduction and universal acceptance." ³⁸ Popular graphic images drew the public once again--and even more deeply this time--into an enthusiasm for laboratory research and science-based therapies.



American papers and magazines frequently printed a rather engaging portrait of a handsome and younger-than-he-actually-was Robert Koch. ³⁹ In some papers this was paired with a rather lifeless sketch of the physician in his laboratory. *Frank Leslie's Illustrated Newspaper* printed a full-page suite of pictures that combined these two images with four technical drawings labeled "Fresh Bacilli from the Lungs of a Consumptive Patient, as Seen under the Microscope," "Bacilli after Two Weeks' Growth, under the Microscope," "Tube Containing a 'Culture' of Tuberculous [End Page 658] Bacilli," and "Tube Containing 'Culture' of Comma (Cholera) Bacilli." The page carried a firmly optimistic caption: "The Prevention and Cure of Consumption--Dr. Koch's Great Discovery" (see [Fig. 12](#)). ⁴⁰ Even though microscopes, specimens, and "cultures" had at this date not yet become routine aspects of medical training and practice, they were familiar to a broad segment of the public from parlor science activities, microscopical societies, and such cartoons as seen in Figure 1 above, which earlier that same year had portrayed the U.S. president under Uncle Sam's microscope.



The tuberculin cure--like Pasteur's rabies treatment--quickly came to be represented as much by the lucky patients in their moment of celebrity as by the physicians involved. When an American patient was sent to Berlin for treatment with funds raised by *Frank Leslie's Illustrated Newspaper*, an artist accompanied him to record the life-saving interventions, starting with the patient's pretreatment examination in New York by Dr. George F. Shrady, a leading New York physician and editor of the *Medical Record* from 1866 to 1904 (see [Fig. 13](#)). Note the inset portrait of the patient, William Degan, on the lower right, given the same individuality and prominence as the physician's portrait on the upper left. *Frank Leslie's* would, of course, shortly provide the American public with a full-page illustration of this patient's treatment in Berlin. ⁴¹ In another issue, **[End Page 659] [Begin Page 661]** this paper also printed a quarter-page engraving of "Sir Morell Mackenzie Injecting Dr. Koch's Lymph at the Throat Hospital, London." ⁴²

Without delay, political cartoonists grabbed new images from this "latest sensation," sometimes even jumping ahead of the news engravings, as they tapped the public's excitement about tuberculin as the greatest breakthrough of the era--and perhaps of all human history! *Puck's* leading artist, Joseph Keppler--possibly encouraged by the similarity of Robert Koch's oval face with full beard to that of Keppler's favorite target, James G. Blaine (of the "Blainiac rabies" cartoon in [Fig. 5](#) above, as well as many other caricatures)--made the lymph cure for consumption the centerpiece of its major cartoon for the 10 December issue (probably printed a week earlier). In "A Bad Case of Consumption--Dr. Blaine Tries an Injection of His Reciprocity Lymph," the sick Republican Party elephant is surrounded by top-hatted physicians consulting **[End Page 661]** on the case; one of them is timing the elephant's pulse with a watch in one hand and the animal's tail in the other. ⁴³ The elephant and the doctor were stock images of medical caricature, but here they are pushed to the side by two important novelties: the hypodermic syringe (made popular via the Brown-Séquard elixir shortly before) and its injectable medication ("Reciprocity Lymph"). While the political issues of reciprocity, free trade, and protectionism were commonplaces of the era, the latest therapy's bring-them-back-from-death's-door potential was quite new, echoing the miraculous rabies cure of just five years before. To exaggerate the mysterious power of the lymph as well as Blaine's mercurial character (he is shown standing on "Blaine's reversible platform"), the cartoonist has dressed Blaine as a wizard, unlike the recognizably contemporary physicians to his left and right. ⁴⁴ **[End Page 662]**



Widespread familiarity with the new lymph and with Koch as its inventor was implied as well by *Judge* magazine's cartoon attack on problems in the Democratic party just a week later ([Fig. 14](#)): dressed in the traditional top hats and armed with carefully depicted (if enlarged) syringes, Dr. Koch-Cleveland and Dr. Koch-Hill proffer competing therapies to revive the ailing Democratic Party tiger. ⁴⁵ As with *Puck's* cartoon, the political issues were old hat ("humbug reform lymph" vs. "spoils system lymph"), but the medical metaphors used to mock them were then brand new.

When disappointing results of the tuberculin treatment started appearing in January 1891, humorists, journalists, physicians, and patients turned against Koch. The *Danbury*

Evening News was typical, reporting on 23 January 1891 (the day after it heralded the delivery of five vials from Berlin to President Harrison) that people were finding Koch's lymph "a failure"; William Degan, the first American patient to be treated in Berlin, was said to believe he had derived no benefit and was in poorer health than when he went abroad. ⁴⁶ On 3 February, this paper reported the death in New Haven of George M. Bradley, "the first person treated in America with Dr. Koch's lymph," and the near-death condition of "the son of Professor Blake" of Yale. ⁴⁷ But another Yale professor (probably Russell Chittenden, the eminent teacher of physiological chemistry) defended the lymph as not to be judged by one extreme case. Two days later, this paper reported that a package containing lymph from Berlin had arrived in Danbury, that it would be discussed at a medical society meeting that evening, and that the lymph would be "on exhibition today at Reed & Co.'s drug store." ⁴⁸

While everything seemed so promising, most were willing to overlook Koch's reticence about the formulation of his tuberculin lymph, and his rush to treat hordes of patients without preliminary studies on a limited number. When the lymph failed to cure, and sometimes aggravated, a patient's consumption, the media and the medical profession challenged **[End Page 663]** him for being mercenary as well as for having failed, and they accused him of inappropriately pursuing publicity and fame. Without admitting their own complicity in creating a sensation, papers started to offer comic put-downs like the following quip: "A Voice from the Medical Limbo.--'Hello there, Koch's lymph! I'm expecting you.'--'Who are you?'--'I'm Brown-Sequard's elixir of life.'" ⁴⁹ And the following January, in a back-page cartoon of seven vignettes entitled "A Chapter on Cranks," the artist Emil Flohri included Dr. Koch's Lymph for Consumptives along with the Brown-Séquard Elixir of Life, Dr. Pasteur's Treatment for Rabies, and Dr. Keeley's Bichloride of Gold treatment for drunks under the rubric "Cranks who made it pay while it lasted." ⁵⁰ From today's perspective, the innovations of Pasteur, Brown-Séquard, Koch, and Keeley are quite dissimilar in origin, medical value, and intellectual achievement; yet this cartoon, despite its broad brush, offers confirmation that breakthroughs were already coming to be seen by the public as a continuous series. ⁵¹

Serum to Save Sick Children

By the summer of 1894, European results were accumulating to show that diphtheria "anti-toxine" injections sharply reduced the mortality **[End Page 664]** from this frightening childhood malady. ⁵² Like rabies vaccine, testicular extract, and tuberculin therapy, this was an injectable biological product derived from laboratory experiments with small animals--but unlike those breakthroughs, this one earned permanent recognition by historians and the public alike as a major triumph over disease. ⁵³ Stimulating rapid recovery in mortally ill patients, especially children, was far more dramatic than explaining illnesses or even preventing them; and this was a sudden and striking therapeutic achievement, often lowering case mortality from 50 to 15 percent.

The creation of this anti-toxine had been founded on the identification of pathogens, but it took that knowledge in a new direction by manipulating animals' immune response to

create a potent biological product: blood serum (most effectively produced by horses) containing high concentrations of a diphtheria antagonist that, when injected in people, would help their bodies combat the disease. It was the result of collaboration and competition between French and German laboratories. Americans did not create the cure, but they quickly found ways to manufacture it effectively on this side of the Atlantic, and they made it their own once they had managed to secure the new levels of public funding required for its production. The pioneering effort in America was that of laboratory-based public health physicians in New York City, with other cities and commercial firms quickly following their lead. [54](#) **[End Page 665]**

America's daily newspapers began in the summer of 1894 to print encouraging reports of European trials of the new serum treatment. In mid-September, *Harper's Weekly* editorialized on "The New Remedy for Diphtheria." This rather long and unillustrated piece established in firm and measured tones several key features that shaped the events to follow:

A representative of the New York Board of Health has just returned from a trip abroad, made for the purpose of investigating a new German remedy that is said to be almost a certain cure for diphtheria. His report is so enthusiastic that our authorities are to be asked to establish a laboratory for the development of the remedy here. The outcome will be awaited with anxious interest by every one who truly understands how much is at stake. [55](#)

The second paragraph argued the special urgency of this cause with revealing numbers and a picture of definite historical progress:

Two years ago there was much ado because typhus fever seemed to have gained a foothold in the city. That much-heralded disease caused 40 deaths; diphtheria, unheralded, caused 1436. Last year there was no little apprehension in some quarters because small-pox was mildly epidemic in the city, claiming a few victims who by their folly or ignorance had invited it. Yet small-pox during the decade 1883-'92 caused only 335 deaths in the city; diphtheria caused 15,066. Thanks to sanitary science, typhus may be held at bay. Thanks **[End Page 666]** to Jenner, the terrors of small-pox are only traditional. But the terrors of diphtheria are still real and ever-present. [56](#)

The editorial then noted the discovery, ten years before, of the cause of diphtheria. It explained that the bacilli produce toxins, which may be developed in media other than the human body; and that toxins, when attenuated, may be injected into animals whose bodies then produce something that had now been shown to cure cases of diphtheria in humans. "If the reports are to be credited, diphtheria will soon take its place beside small-pox and hydrophobia behind the victorious chariot of preventive medicine." [57](#) In closing, the editor reminded readers not to let optimism go beyond actual achievement, as had sadly been the case with Koch's tuberculin. (Note the use of what was becoming a customary list of triumphs: smallpox, rabies, and diphtheria, with tuberculin as the single failure that highlighted the successes in the series.)



News reports in the dailies continued sporadically through the fall. In November, *Scientific American* published a more substantial report whose three illustrations established the leading visual elements for all the successive depictions: medical personnel injecting the remedy into the belly of a sick child ([Fig. 15a](#)), white-coated laboratory workers surrounded by flasks and tanks, and docile and dignified horses patiently receiving injections or allowing their blood to be drawn ([Fig. 15b](#)). ⁵⁸ None of the participants in these scenes was identified, nor was a specific hospital, laboratory, or city named. Though generic (perhaps created by American artists merely from verbal accounts), these pictures were to become iconic. ⁵⁹ **[End Page 667] [Begin Page 669]**

The stream of brief newspaper accounts widened in early December, when the *New York Herald* began an aggressive campaign in support of funding to set up the laboratory and stables needed for the production of anti-toxine. This was the newspaper that had led the pack in coverage of the Newark boys' trip to Pasteur's laboratory in Paris back in 1885. By 1894, changes in printing technology allowed daily newspapers to run pictures that were more than one column wide. ⁶⁰ This had two effects: it provided a new hook for quick emotional engagement, and it made possible much larger graphics to compete with those in the heavily illustrated weeklies. On Monday, 10 December, the *Herald* published five pictures in an article that covered five columns of a six-column page. Opening this piece, a tall stack of headlines announced the issues and pumped up the excitement:

ANTI-TOXINE FOR THE POOR.
Popular Subscription Started by the Herald
to Provide Dr. Roux's Great Remedy for Diphtheria for the Public.
HEADS THE LIST WITH \$1,000.
Public Invited to Join in the Work of
Supplying the Health Restoring Fluid.
PHYSICIANS APPROVE THE PLAN.
Drs. Curtis, Edson, Shrady, Gibier, Jacobi, and
Loomis Indorse [*sic*] the Herald's Enterprise.
NEED OF SERUM URGENT.
Many Lives Will Be Saved If It Can
Be Brought Within the Reach of All. ⁶¹ **[End Page 669]**

A two-column-wide portrait of Dr. Émile Roux dominated the page, supplemented by four single-column images: Professor Emil Behring, M.D.; "In the Laboratory" (a man standing at a bench covered with glassware); Dr. Cyrus Edson; and Dr. Paul Gibier.

The following day, 11 December, the *Herald's* mass audience was presented with the sketch that had earlier been seen only by the more restricted readership of *Scientific American*: "Inoculation with Anti-toxine" (the same image as Fig. 15a here). This print was four columns wide (about 7 inches by 10) and was placed at the top of the page, next to another batch of self-promoting headlines:

ALL EAGER FOR ANTI-TOXINE.
Enthusiastic Support of the Herald's

Project for Manufacturing the Great Diphtheria Remedy in This Country.

UNIVERSAL COMMENDATION.

Physicians and Other Scientists Approve
the Enterprise in Flattering Terms.

IT MEANS A SAVING OF LIFE.

Leaders in Medicine Pronounce the
Undertaking One of Commanding Importance.

OTHER CITIES APPLAUD IT.

Prompt Assistance Means Early Success, and
Money Is Imperatively Required. [62](#)

On the next day the *Herald* reprinted the horse picture from *Scientific American* (same as Fig. 15b here) over the caption "Taking the Serum from a Horse," again in four-column width at the top of the page, with headlines proclaiming "Anti-Toxine Is Greatly Needed. A Chorus of Approvals Everywhere. . . . Physicians Greatly Hampered by Their Inability to Obtain the New Cure." [63](#)

We cannot here follow more fully the *Herald's* fascinating and unprecedented campaign to make this miraculous breakthrough cure available to thousands of threatened children, as we must restrict our attention to the ways in which widely published pictures--in the *Herald* and elsewhere--of the medical heroes, their laboratory-based efforts, and their compliant horses made key features of the new medicine familiar and favored in a wide segment of the public. While the media's graphics were not the only shaper of the new consciousness of medical advance that took **[End Page 670]** hold in America after 1885, these resonant snapshots could remain in memory long after the particular verbal details of any day's news had faded.

The frequent reiteration of horse pictures suggests that these were especially engaging. [64](#) But even if horses heightened the emotionalism of the pictures, didacticism was present as well. The public was served with numerous images of serious men handling the precious serum and manipulating elaborate glassware in settings that nicely mingled hectic activity and scientific order. In some, there were impressively neat rows of flasks; in others, the important work took place on benches crowded with apparatus in less discernible order. "Separating the Serum from the Red Corpuscles of the Blood" was the caption for the *Herald's* picture on 13 December, encouraging the public's curiosity about the underlying components of an apparently homogeneous fluid. [65](#) Then, after three days without illustrations, the horses returned on 17 December in three new images about the preparation of the serum and care of the horses. [66](#) Three days later, on the 20th, a two-column picture showed five men "Inoculating a Horse at the Veterinary College." [67](#) Another three days, and the *Herald* printed an interior view of a generic stable with three of these noble animals and no attendants, "Horses under Treatment," in an article headlined "Life Saved by Anti- Toxine--The Remedy Reduces the Death Rate from Fifty to Fourteen Per Cent. . . . Doctors Actively at Work--Bacteriologists Who Supervise the Herald Fund Busily Engaged in Producing Curative Serum." [68](#)

January 1895 saw the American edition of the British monthly *Review of Reviews*

opening its first issue of the new year with "The Progress of the World," whose very first entry was "A New Medical Discovery"--including a portrait sketch of "Professor Roux, Discoverer of Anti-toxine," and "Inoculating a Diphtheria Patient," an (uncredited) reprint of the child's inoculation that had appeared in *Scientific American* ([Fig. 15a](#) above) in **[End Page 671]** mid-November and in the *Herald* in mid-December. ⁶⁹ The latter picture was to be published again shortly in *Leslie's Illustrated Weekly* on 17 January, where it was joined by the horse providing serum ([Fig. 15b](#) above), likewise printed earlier in both *Scientific American* and the *Herald*. ⁷⁰



Harper's Weekly opened the new year with a full-page article and four pictures on 5 January 1895 ([Fig. 16](#)). ⁷¹ These are the last major graphics for this episode, and they point, perhaps unknowingly, toward the dominant iconography of the future: the long-familiar engravings from artists' sketches that had dominated popular pictorial media for decades--Winslow Homer, Frederick Remington, and Thomas Nast virtually defined the Victorian newsmagazine's visual style--were here replaced by unsigned photographs. While photography was not entirely new in these magazines in 1895, it was beginning to achieve a clarity and power that would eventually dominate reportorial images and magazine covers. (For several decades, artist-illustrators did manage to hold their own in advertising and cover art--think of J. C. Leyendecker with his Arrow-shirt-collar men or Norman Rockwell with his all-American folks.) Three of the *Harper's* photographs used the new medium to capture very familiar scenes: male physicians inoculating a child, with a female nurse's assistance; ordered ranks of Erlenmeyer flasks (given their formal name); and a laboratory worker among flasks, tanks, and sterilizing equipment. The fourth image also was very traditional in appearance, just a six-story building of undistinguished architecture, but its caption revealed how innovative it was: "Pasteur Institute Where Antitoxine Is Made in New York." This five-year-old organization, headed by Dr. Paul Gibier, had **[End Page 672] [Begin Page 674]** taken not only its name from the creator of the rabies breakthrough, but also its purpose: the ongoing production of fresh biological material used in the rabies treatment. When the need arose to manufacture diphtheria anti-toxine by a similar biological method, Gibier's institute had the infrastructure already in place to supply some of the first anti-toxine in America. ⁷²

As we have seen, the popular pictorial materials connected with the introduction of diphtheria anti-toxine largely continued the features established in the preceding breakthrough episodes. But there was one difference: humor seems to have been completely absent. While news drawings and magazine photographs had become even more numerous than before, the usual cartoons, caricatures, and jokes about the latest sensation disappeared for a while. ⁷³ This change was not permanent, however, for in less than two years the discovery of ways to produce X-ray pictures of the body's interior would draw delighted humorists back into **[End Page 674]** the business of toying with the latest medical breakthrough. The American media's fascination with X rays in early 1896 also illustrates how the pictorial dimensions of the medical breakthrough would persist even as the instances proliferated. The X-ray story is not included here because it has received more scholarly attention than these first four episodes, and a number of its images have been reproduced in other studies. ⁷⁴

Publicity, Public Attitudes, and the Image of a New Kind of Medicine

By early 1895, a family magazine of middle-class leisure time was calmly discoursing about toxins, anti-toxines, incubators, Erlenmeyer flasks, autoclaves to sterilize chicken broth for colonies of diphtheria microbes to feed upon, and serum extracted from horses. It was also inviting readers to admire (and perhaps to consider supporting) a substantial building devoted exclusively to this new kind of life-saving work. The daily papers, reaching farther down the range of social class than the weeklies, showed many of the same images and used the same vocabulary, although they worked more horses into the visual mix. This was historically a new vocabulary, drawn more from the laboratory than from **[End Page 675]** the clinic, based on the mid-century achievements of cell theory and bacteriology and their powerful offspring, germ theory and immunology. Much of it was more than ten years old, but it had achieved its new visibility and social power from the intense enthusiasm connected with breakthroughs in just the few years since the rabies announcement of 1885. It seems likely that this enthusiasm for innovative therapeutic interventions may have had a wider and deeper effect on American culture than just making people familiar with new kinds of injections for hydrophobia, consumption, and diphtheria. Research itself had become visible; medical innovation was now a public thrill.

Published materials like the graphics examined above can take us only part of the way toward an understanding of what the public thought. Even if these publications shaped public attitudes, they cannot, by themselves, reveal people's thoughts and feelings; yet the limitation inherent in such evidence may be overcome when it is complemented by more private sources, such as letters and diaries--or by people's actions. For this reason it is useful to glance back for a moment and observe that within the cases examined above, at least a few such actions are documented. Since thousands of people paid admission fees to enter a museum or a theater to see Pasteur in wax or Pasteur's patients in the flesh, we can discern with confidence a mass involvement in the rabies vaccine excitement. When hundreds, perhaps thousands, of individuals mailed in their contributions to the newspaper campaigns, first to send the Newark boys to Paris, and then to establish diphtheria-serum production facilities, they made concrete the effects of the articles and pictures. When twelve thousand physicians were injecting patients with an animal-testicle extract of questionable safety and value within eighteen months of its introduction, they were responding to an irresistible popular enthusiasm for the newest production of the medical laboratory (and this in an era when some people hesitated to accept vaccination for smallpox because it employed lymph taken from a calf!).

These episodes of popular excitement about medical advances (or apparent advances) have not received much attention in the standard accounts of nineteenth- and early-twentieth-century American medicine, perhaps because the discoveries that garnered the headlines often lacked the intellectual significance that most historians have used as the criterion for medical landmarks. But in neglecting these episodes, scholars may have overlooked a significant mechanism by which the general public came to replace an attitude of cynical disdain about medicine's pretensions with an unalloyed enthusiasm and a passion for more and bigger discoveries. While historians have recognized for some time that **[End Page 676]** around the turn of this century the medical profession

rose to cultural and social authority, a change best described in the brilliant synthesis of Paul Starr's *The Social Transformation of American Medicine*, Starr and others have provided only a rather general sense of the role played by science in bringing this about.

⁷⁵ The specific breakthroughs whose imagery has been documented here seem likely to have been crucial stimuli of public acclaim for medicine. Additionally, they help us picture what kind of science played this role, what the general public got excited about, when the shift occurred, and which particular features of medical research were prominent in the transition. While the general public's new enthusiasm in the 1880s and 1890s for sudden, headline-grabbing therapeutic advances was not the only factor in establishing the broad cultural authority that medicine held for most of the twentieth century, it deserves a place of recognition alongside such factors as the rise in medical philanthropy (which it helped to promote), the expansion of knowledge in physiology and other basic medical sciences, and the general expansion of the profession's surgical and therapeutic powers.

In any analysis of the penetration of the news about useful discoveries into mass culture, the particular role of widely disseminated graphic images must be paramount. Photographs and cartoons ensured that the headlines were more memorable and gave the ideas and attitudes a purchase that was not available to the more mundane expositions of teachers, schoolbook writers, or popularizers of science. While the portrayal of these matters in the popular press did not mean that they were comprehended or valued by all members of the public, or even by all [End Page 677] members of the medical profession, it did mean that public awareness of laboratory science in medicine, of medical advance, and of therapeutic success had been planted and was taking root. With each new success came new pictures of medicine and new expectations--and the American public never saw medicine in the same old way again.

[Bert Hansen](#) is Associate Professor of History at Baruch College of The City University of New York, Box A1610, 17 Lexington Avenue, New York, NY 10010 (e-mail: bert_hansen@baruch.cuny.edu). He earned the A.B. degree in chemistry from Columbia College and the Ph.D. in history of science from Princeton University. He has published on science and magic in the Middle Ages (*Nicole Oresme and the Marvels of Nature*, 1985); on obstetrics teaching and practice (*New York State Journal of Medicine*, August and September 1985, 85: 488-98 and 548-59); on homosexuality and medicine (essay in *Framing Disease*, 1992, reprinted in *Sickness and Health in America*, 3d ed., 1997); on public health cartoons (*American Journal of Public Health*, 1997, 87: 1798-1807); and on Pasteur in the American press (*American Historical Review*, 1998, 103: 373-418). He is presently writing a book on medical breakthroughs in American culture.

Notes

*An early version of this study was presented at the seventieth annual meeting of the American Association for the History of Medicine, Williamsburg, Virginia, 5 April 1997. I wish to acknowledge the assistance and suggestions of many colleagues, especially Kenneth L. Caneva, Ronald J. Fasano, Evelyn M. Hammonds, William H. Helfand, Jean Howson, Adele A. Lerner, Howard Markel, Ronald L. Numbers, and Charles E. Rosenberg. It is a pleasure also to acknowledge several forms of support for my research: a Eugene M. Lang Junior-Faculty Research Fellowship; funding from the PSC-

CUNY Awards Program; released time from the George and Mildred Weissman School of Arts and Sciences of Baruch College; and residence at the Institute for Advanced Study, Princeton, N.J. All illustrations except for figures 6, 8, and 11 are the property of the author.

1. William G. Rothstein, "When Did a Random Patient Benefit from a Random Physician: Introduction and Historical Background," *Caduceus*, 1996, 12 (3): 2-8, quotation on p. 3. The special section of the journal, "When Did a Random Patient Benefit from a Random Physician," was edited by Rothstein and contains six brief but perceptive essays on the question, its significance, and possible answers to it. In addition to Rothstein (introduction), the contributors are Rosemary Stevens (technology and institutions), Dale C. Smith (surgery), Steven J. Peitzman (internal medicine), John Parascandola (drug therapy), and Gerald N. Grob (psychiatry). Most place the shift solidly after 1900, with Parascandola locating it after World War II. While this question, along with an answer of 1910 or 1912, has long been attributed to Lawrence J. Henderson, it has not been documented in his writings.

2. *Judge*, 12 December 1885, p. 2.

3. *Judge*, 2 January 1886, p. 10.

4. Charles E. Rosenberg, "The Therapeutic Revolution: Medicine, Meaning, and Social Change in Nineteenth-Century America," in *The Therapeutic Revolution: Essays in the Social History of American Medicine*, ed. Morris J. Vogel and Charles E. Rosenberg (Philadelphia: University of Pennsylvania Press, 1979), pp. 3-25.

5. For an extended account, see Bert Hansen, "America's First Medical Breakthrough: How Popular Excitement about a French Rabies Cure in 1885 Raised New Expectations for Medical Progress," *Amer. Hist. Rev.*, 1998, 103: 373-418. The Pasteur section below recapitulates only those features of the story essential for understanding its pictorial documents and the momentum it generated for the breakthroughs that followed.

6. On the cholera germ, see William Coleman, "Koch's Comma Bacillus: The First Year," *Bull. Hist. Med.*, 1987, 61: 315-42. Similarly, Pasteur's anthrax triumph garnered little press, even though twentieth-century accounts often imply that it received substantial coverage and much popular interest. Even in France, it received relatively little attention in newspapers, contrary to what is implied by the title of a recent study by Massimiano Bucchi, "The Public Science of Louis Pasteur: The Experiment on Anthrax Vaccine in the Popular Press of the Time," *History and Philosophy of the Life Sciences*, 1997, 19: 181-209. Mass culture's invasion by certain medical ideas has been elegantly chronicled in Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge, Mass.: Harvard University Press, 1998). Important insights about certain aspects of public reactions to laboratory medicine are found in Susan E. Lederer, *Subjected to Science: Human Experimentation in America Before the Second World War* (Baltimore: Johns Hopkins University Press, 1995).

7. A number of scholars have explored the place of science in American medicine; see especially essays in Vogel and Rosenberg, *Therapeutic Revolution* (n. 4), and pp. 178-83

in John Harley Warner, "The History of Science and the Sciences of Medicine," *Osiris*, 1995, 10: 164-93. Also important are several other works by 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*, ed. Andrew Cunningham and Perry Williams (Cambridge, U.K.: Cambridge University Press, 1992), pp. 110-41; "Ideals of Science and Their Discontents in Late Nineteenth-Century American Medicine," *Isis*, 1991, 82: 454-78; *The Therapeutic Perspective: Medical Practice, Knowledge, and Identity in America, 1820-1885* (Cambridge, Mass.: Harvard University Press, 1986; reprinted, Princeton: Princeton University Press, 1997); *Against the Spirit of System: The French Impulse in Nineteenth-Century American Medicine* (Princeton: Princeton University Press, 1998). While W. F. Bynum's *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge, U.K.: Cambridge University Press, 1994) intentionally directs its focus more to Europe than America, it nonetheless provides an effective overview of relevant material and offers perceptive attention to the popular press and the public face of medicine.

8. John Harley Warner, in a new preface to the 1997 reissue of *The Therapeutic Perspective* (n. 7), p. ix.

9. That the profession at times exhibited more skepticism about highly touted unfamiliar therapies than did the public (which was normally skeptical about the profession's therapies in general) has been noted by others. For example, Susan E. Lederer observed of the medical profession that "like antiseptic surgery, rabies vaccine and virtually all bacteriological claims in this period, the introduction of [diphtheria] anti-toxin was muddled by initial scepticism and disillusionment. In the case of diphtheria, the complex aetiology of the disease process and the disappointment just three years earlier of Koch's tuberculin cure hindered the acceptance of the anti-toxin by the medical profession" ("The Controversy over Animal Experimentation in America, 1880-1914," in *Vivisection in Historical Perspective*, ed. Nicolaas A. Rupke [London: Croon Helm, 1987], pp. 236-58, at p. 242). In France, a similar picture emerges; for example, in a rich examination of how the bacteriological revolution was played out both in the profession and in the general population, Evelyn Bernette Ackerman observed that "popular eagerness about diphtheria antitoxin was much more immediate and much less nuanced than medical response" (*Health Care in the Parisian Countryside, 1800-1914* [New Brunswick, N.J.: Rutgers University Press, 1990], p. 99).

10. John A. Kouwenhoven, *The Columbia Historical Portrait of New York: An Essay in Graphic History in Honor of the Tricentennial of New York City and the Bicentennial of Columbia University* (Garden City, N.Y.: Doubleday, 1953), p. 11. On the use of comic art, see also Thomas Milton Kemnitz, "The Cartoon as a Historical Source," *J. Interdiscip. Hist.*, 1973, 4 (1): 81-93. An important recent study of late-nineteenth-century news illustrations and readership is Joshua Brown, "Reconstructing Representation: Social Types, Readers, and the Pictorial Press, 1865-1877," *Rad. Hist. Rev.*, Fall 1996, 66: 5-38. See also Marianne Doezema, "The Clean Machine: Technology in American Magazine Illustration," *J. Amer. Cult.*, 1988, 11 (4): 73-92.

11. For images of this sort from the period before 1870, see the 125 figures in William H. Helfand, *Medicine and Pharmacy in American Political Prints (1765-1870)* (Madison,

Wis.: American Institute of the History of Pharmacy, 1978). For the decades following 1860, a brief introduction to pictorial satire and propaganda related to public health is offered in Bert Hansen, "The Image and Advocacy of Public Health in American Caricature and Cartoons from 1860 to 1900," *Amer. J. Pub. Health*, 1997, 87: 1798-1807. In the public health cartoons, however, physicians are not usually portrayed as heroic, but rather as neglectful, negligent, or evil. For an especially perceptive essay, see the opening chapter of Sander L. Gilman, *Picturing Health and Illness: Images of Identity and Difference* (Baltimore: Johns Hopkins University Press, 1995), "How and Why Do Historians of Medicine Use or Ignore Images in Writing Their Histories?" pp. 9-32.

[12](#). The microscope's increasing employment by the profession has been observed by historians, but its chronology has not been traced with more quantitative precision than assigning it generally to the 1880s or 1890s. Joel D. Howell observed that "only a small minority" of physicians used it in 1879 (*Technology and American Medical Practice, 1880-1930: An Anthology of Sources* [New York: Garland, 1988], p. 63). Prior to the 1880s, the microscope was much more popular among laymen than among physicians, as John Harley Warner has shown in "'Exploring the Inner Labyrinths of Creation': Popular Microscopy in Nineteenth-Century America," *J. Hist. Med. Allied Sci.*, 1982, 37: 7-33; see esp. pp. 19 and 30 for change after the late 1880s. For the situation at mid-century, see also James H. Cassedy, "The Microscope in American Medical Science, 1840-1860," *Isis*, 1976, 67: 76-97; and Deborah Jean Warner, "The Campaign for Medical Microscopy in Antebellum America," *Bull. Hist. Med.*, 1995, 69: 367-86. On its relatively limited use by physicians even later in the century, see a variety of comments in *The Education of American Physicians: Historical Essays*, ed. Ronald L. Numbers (Berkeley: University of California Press, 1980): in 1881, it was not useful in practice (p. 35); prior to 1870, there was some use in medical schools (p. 59); and in 1840s and 1850s, it made its entrance into various branches of medicine (pp. 131-32). The famous advice book by D. W. Cathell refers to a practitioner's microscope as an aid to precision recognizable by patients and describes it as one of the instruments that improve a patient's confidence in the physician: *The Physician Himself and What He Should Add to His Scientific Acquirements*, 3d ed. (Baltimore: Cushings & Bailey, 1883), pp. 11, 18. But as late as 1884, when William Osler first held the chair of clinical medicine at the University of Pennsylvania, his personal microscope was the only one in use at the University Hospital; see George T. Harrell, "Osler's Practice," *Bull. Hist. Med.*, 1973, 47: 545-68, at p. 550.

[13](#). Examples of contemporary news pictures of group vaccinations in public are found in *Harper's Weekly* (6 May 1871, 16 March 1872, and 28 October 1893) and in *Frank Leslie's Illustrated Newspaper* (19 April 1879, 14 May 1881, and 19 November 1881). *Puck* offered a full-color centerfold cartoon on 24 June 1885 (pp. 264-65), by Joseph Keppler: "Scientists know that all diseases can be prevented by inoculation. Now, my friends, step right up and be vaccinated for all forms of disease to which bank officials are liable."

[14](#). Joseph Meister, who received injections in July 1885, was the first; Meister's "cure" and the recent vaccination of Jupille were announced by Pasteur in the same late-October report. Meister and Jupille have long been regarded in all accounts as the first and second patients to receive this novel and untried remedy. Only recently did an

examination of Pasteur's private notebooks by Gerald L. Geison reveal that Pasteur and his physician collaborators tried some form of rabies therapy on two earlier patients in May and June 1885: *The Private Science of Louis Pasteur* (Princeton: Princeton University Press, 1995), pp. 195-205. The existence of these earlier cases raises important questions about how accurately Pasteur discussed his work at the time, but it does not change the significance of the two public patients who received the full series of injections that became standard procedure. Additionally, my examination of American newspapers turned up a lengthy account of what would be--if true--a third pre-Meister patient: see "Pasteur's Sure Success; His Hydrophobia Discoveries Put to the Test; Report of the Commission Sustaining Him; Some of His Methods; Work on a Human Subject," *New York Times*, 26 August 1884, p. 3, cols. 1-2 (with a related editorial, p. 4, col. 2). Given the early date for such a treatment, I assume that this unsigned article with a dateline of Paris, 13 August, is either fortuitously prescient fiction or a hoax--or perhaps a faithful transmission of some European fiction or hoax.

[15](#). All nineteenth-century magazines and weekly papers are cited herein by the "cover date" of the issue. But with respect to priority issues and for establishing a day-by-day narrative, it must be kept in mind that weeklies were printed earlier and were sometimes available to readers as much as seven or eight days before the cover date; this means that a magazine image might appear to follow a daily's story while in fact preceding it. This image of Jupille was also published in *Scientific American*, 19 December 1885, p. 391--the same day that it appeared in *Harper's Weekly*. In the United States, it had previously appeared in the *New York Daily Graphic* of 19 November 1885 (p. 4). The cover date for *L'Illustration*, the French source of these reprints, was 7 November 1885.

[16](#). I am giving here the simple picture presented in Pasteur's public statements and the early authorized accounts. The recent scholarship of Gerald Geison gives us a far more complex picture of Pasteur's thinking, research, and practice; see *Private Science* (n. 14), chaps. 7-9. Since the more accurate version of events that Geison has uncovered was not known in the 1880s, however, only the traditional picture is relevant to my examination of the public's response in the nineteenth century.

[17](#). For more on the varied American engagements with Pasteur's hydrophobia discovery, see Hansen, "America's First Medical Breakthrough" (n. 5).

[18](#). *New York Herald*, 22 December 1885, p. 2, col. 1.

[19](#). *New York Tribune*, 9 January 1886, p. 7, col. 6.

[20](#). Modern historians and epidemiologists, knowing how infrequent an ailment hydrophobia was, may hesitate to accord the Pasteurian preventive treatment the landmark character that the public gave it in the 1880s: in a large city of that era, the annual mortality from rabies was usually ten or fewer, while deaths from tuberculosis and the other major killers were measured in the tens of thousands. But in the late nineteenth century, medical professionals and ordinary citizens alike knew that the cities were filled with stray dogs, that dog bites were all too common (especially among children), and that--in the absence of any quick and accurate diagnostic test--every single dog bite prompted fear and panic about possibly facing a horrible death in a month or so, even if

the wounds healed quickly.

[21.](#) The Pasteur Institutes in the United States were independent of each other and of the institute in Paris, unlike those in the network of roughly thirty French-founded institutes around the world. Few historians seem even to have noticed the American organizations, and fewer still have examined any aspect of their activity in print. There is no full account. For references to published and unpublished studies, see Hansen, "America's First Medical Breakthrough" (n. 5), pp. 407-8.

[22.](#) See "The Boys Who Were Bitten. More Than \$1,000 Subscribed to Send Them to Paris. The Views of Dr. Billings on Cauterization for Mad Dog Bites. The Boys Go Aboard the Steamship Canada This Afternoon," *New York Sun*, 8 December 1885, p. 1, col. 5; "The Children's Farewell. Dr. Pasteur's Little Patients Sail on the Steamer Canada. They Bid Good-By to America with Tears in Their Eyes--Dr. Billings Accompanies Them, and Promises to Take Every Care of Them--One of the Dogs Shows Symptoms of Hydrophobia," *New York World*, 10 December 1885, p. 5, cols. 1-2; and an unsigned editorial, *New York Evening Post*, 10 December 1885, p. 2, col. 1 ("We do not always agree with the *Sun*, as our readers know, on public questions, but justice compels us to call attention to the fact that it had what is called in journalism a 'clean beat,' as against its rival, the *World*").

[23.](#) *New York Daily Graphic*, 19 December 1885, p. 1; 3 January 1886, p. 4. The full cover and the sketch of the Newark scientists inoculating a rabbit are reproduced in Hansen, "America's First Medical Breakthrough" (n. 5), pp. 392, 394.

[24.](#) "The Profession Gone Mad," by G. E. Ciani, *Puck*, 13 January 1886, p. 314. This cartoon is reprinted in Hansen, "America's First Medical Breakthrough" (n. 5), p. 402.

[25.](#) Fig. 9 shows just the middle section of a large centerfold image measuring 13 X 19 inches. A highly reduced black-and-white photograph of the entire caricature is reproduced in Hansen, "America's First Medical Breakthrough" (n. 5), p. 400.

[26.](#) *Monthly Catalogue of the Eden Musée* (New York, August 1886), p. 29 (emphasis added). The Pasteur group was placed in the Museum's Central Hall. I am very grateful to Fred and Margaret Whitaker of Pine Bush, N.Y., for kindly sending me a photocopy of pages from this rare catalog.

[27.](#) Brown-Séquard was born a British subject of an American father and French mother; he later became a French citizen. On this episode, see Newell Dunbar, *The "Elixir of Life." Dr. Brown-Sequard's Own Account of His Famous Alleged Remedy for Debility and Old Age, Dr. Variot's Experiments . . . To Which Is Prefixed a Sketch of Dr. Brown-Sequard's Life, with Portrait* (Boston: J. G. Cupples, 1889); J. M. D. Olmsted, *Charles-Édouard Brown-Séquard: A Nineteenth Century Neurologist and Endocrinologist* (Baltimore: Johns Hopkins Press, 1946), pp. 205-39; Merriley Borell, "Brown-Séquard's Organotherapy and Its Appearance in America at the End of the Nineteenth Century," *Bull. Hist. Med.*, 1976, 50: 309-20; Michael J. Aminoff, *Brown-Séquard: A Visionary of Science* (New York: Raven Press, 1993), pp. 163-73.

[28.](#) *Sci. Amer. Suppl.*, 10 August 1889, pp. 11347-48. Even the editorial directing *Scientific American* readers to the *Supplement's* translation cannot forgo sly puns about the potent attractions of such a treatment: "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 of desire among them to try the new medicine" (*Sci. Amer.*, 10 August 1889, p. 80).

[29.](#) For example, in the *New York Times*: "Doctors Who Disagree: The Brown-Séguard Elixir Divides the Medical Profession," 23 August 1889, p. 2, col. 4; "Another Victim of the Elixir," 3 September 1889, p. 1, col. 4.

[30.](#) *Frank Leslie's Illustrated Newspaper*, 24 August 1889, p. 39, col. 1.

[31.](#) "The Elixir of Life," *North Amer. Rev.*, September 1889, pp. 257-64. For more on Hammond's scientific and commercial work in organotherapy, see Bonnie Ellen Blustein, *Preserve Your Love for Science: Life of William A. Hammond, American Neurologist* (Cambridge, U.K.: Cambridge University Press, 1991).

[32.](#) The figures in the center are Charles A. Dana (with a tag to identify him as owner-editor of the *New York Sun*) and Joseph Pulitzer (proprietor of the *New York World*, apparently recognizable without a label), who have brought the Democratic Party (see tag on the tiger's tail) in for Doctor Randall's protectionism treatment. (By chance, Randall died at age sixty-two in April 1890, less than a year after this cartoon appeared.) At the right, "Free Trade" is being carried in by two men coming from the U.S. Capitol, visible behind them in the doorway: Roger Quarles Mills, congressman (later senator) from Texas, and Henry Watterson, editor of the *Louisville Courier-Journal*. Watterson, not "Waterson"--Is the misspelling a further joke on this fellow editor?--was an aggressive advocate of free-trade ideas. Biographical information on political figures, here and elsewhere, comes from the *Dictionary of American Biography* and *Appletons' Cyclopaedia of American Biography*, ed. James Grant Wilson and John Fiske, 7 vols. (New York, 1887-1900).

[33.](#) G. Archie Stockwell, "The Brown-Sequard Discovery," *Sci. Amer. Suppl.*, 19 October 1889, pp. 11509-10. A further indication of popularity is the 1889 publication of a song-sheet in Chicago and Cincinnati, entitled "Brown-Sequard's Elixir: The Greatest Comic Song of the Day," words and music by J. Winchell Forbes. I wish to thank William Helfand for sharing with me a copy of this song.

[34.](#) Olmsted, *Charles-Édouard Brown-Séguard* (n. 27), p. 209.

[35.](#) Koch proposed the use of his tuberculin lymph in 1890 exclusively as a therapy; its value as a diagnostic test became apparent only later, thanks to observations made incidentally on the first cohorts of patients.

[36.](#) See David Leibowitz, "Scientific Failure in an Age of Optimism: Public Reaction to Robert Koch's Tuberculin Cure," *New York State J. Med.*, 1993, 93: 41-48 (this is a revised version of the essay for which Leibowitz received the Osler Medal of the American Association for the History of Medicine in May 1987; as a first-year medical

student, Leibowitz undertook research on this topic under my supervision in the summer of 1985); see p. 43 for the image of Koch as St. George. On the tuberculin story in America more generally, see Thomas D. Brock, *Robert Koch: A Life in Medicine and Bacteriology* (Madison, Wis.: Science Tech Publishers, 1988); Mark Caldwell, *The Last Crusade: The War on Consumption, 1862-1954* (New York: Atheneum, 1988); and Georgina D. Feldberg, *Disease and Class: Tuberculosis and the Shaping of Modern North American Society* (New Brunswick, N.J.: Rutgers University Press, 1995). The Rare Book Room of the New York Academy of Medicine Library, New York, N.Y., holds a contemporary, but anonymous, scrapbook of newspaper clippings about the first several weeks of this episode (labeled "Koch's Tuberculin"). Leibowitz first discovered this item in the Library's general stacks and called it to my attention. It was given to the Academy by a Miss Prudden, possibly a niece of T. Mitchell Prudden--a leading public health physician in New York City, who could well have made such a compilation.

[37](#). For his preliminary examination of the Danbury materials, I wish to acknowledge Mark C. Young, who prepared a research paper on the subject in December 1988 for a graduate history of medicine course that I taught in the Department of History, New York University. My own further research on this paper's stories was made possible through the courtesy of the Connecticut State Library, and I am grateful for their gracious loan of microfilms. I also wish to thank the interlibrary-loan staff of the Newman Library of Baruch College for their steadfast assistance with numerous requests.

[38](#). "Away with Koch's Lymph," *Medical News*, 6 June 1891, p. 625.

[39](#). A small version of this portrait appeared in the *Danbury Evening News*, 22 November 1890, p. 1, col. 3.

[40](#). "The Prevention and Cure of Consumption--Dr. Koch's Great Discovery," *Frank Leslie's Illustrated Newspaper*, 13 December 1890, p. 349; the associated article, "A Visit to Dr. Koch," appears on p. 353. The same portrait had been used six years earlier in *Harper's Weekly*, 30 August 1884, p. 563. In 1890, it was republished by *Harper's Weekly*, 29 November 1890, p. 932, to illustrate the article "Dr. Koch and His Great Work" by Amos W. Wright on p. 934 (with a related editorial, "Dr. Koch's Discovery," on p. 923). A week later the portrait and the laboratory scene appeared together in "Cure of Consumption--An Interview with Professor Koch by Dr. Charles Hacks in *L'Illustration*," *Sci. Amer.*, 6 December 1890, pp. 358-59; since this article was a translation from the report in a French weekly, *L'Illustration*, this was perhaps the source of the American versions of the scene in *Scientific American*, *Frank Leslie's*, and the *New York Herald* of 16 January 1891. This portrait also appeared (in reverse, it seems) in *Illustrated London News*, 1890, 97: 688, according to Kenneth Chew and Anthony Wilson, *Victorian Science and Engineering Portrayed in the Illustrated London News* (Dover, N.H.: A. Sutton, 1993), p. 31. Small sketches of two pipettes, a bottle of lymph, "The Needle," and "The Injection" (into the back of a seated patient) ran in the *New York Herald*, 28 December 1890, p. 23, cols. 1-2.

[41](#). "The Koch Treatment for Consumption--The Patient Sent to Berlin by 'Frank Leslie's Illustrated Newspaper' Operated upon by Professor Ewald, at the Augusta Hospital, Drawn Expressly for the Newspaper by Werner Zehme, Berlin," *Frank Leslie's Illustrated*

Newspaper, 21 February 1891, p. 47. This engraving is reproduced in Leibowitz, "Scientific Failure" (n. 36), p. 44.

[42.](#) The image appeared in a cluster of illustrations under the rubric "Pictorial Spirit of Leading Foreign Events," *Frank Leslie's Illustrated Newspaper*, 27 December 1890, p. 400.

[43.](#) This image is reproduced in Leibowitz, "Scientific Failure" (n. 36), p. 45.

[44.](#) Ten years earlier, Thomas Edison's neuralgia remedy, Polyform, had been mocked in the same magazine by the same artist in a centerfold cartoon: "The Decadence of the Wizard of Menlo Park--From the Phonograph to Polyform," *Puck*, 5 May 1880, pp. 150-51. Joseph Keppler did not invent the wizard appellation: it first appeared in the *New York Daily Graphic* in 1878, according to Wyn Wachhorst, *Thomas Alva Edison: An American Myth* (Cambridge, Mass.: MIT Press, 1981), p. 19, and it was still in current use in the 1890s when the cover image from the 10 January 1891 issue of *Frank Leslie's Illustrated Newspaper* was reprinted on coated stock for separate distribution as "Thomas A. Edison--The Wizard of Menlo Park." Wachhorst explains that Polyform was a mixture of morphine, chloroform, ether, chloral hydrate, alcohol, and spices (p. 32).

[45.](#) Grover Cleveland was currently out of office, having been defeated in his bid for reelection as president in 1888; he would be elected to that office again in 1892. David B. Hill was governor of New York State and would be Cleveland's rival for the Democratic nomination in 1892.

[46.](#) *Danbury Evening News*, 23 January 1891, p. 1, col. 5.

[47.](#) Ibid., 3 February 1891, p. 8, col. 2.

[48.](#) Ibid., 5 February 1891, p. 4, col. 3.

[49.](#) *Judge*, 17 January 1891, p. 267, in a column of jokes.

[50.](#) Ibid., 9 January 1892, p. 34. In the cartoon, these labels appear on four large bottles standing on the floor, each in front of a man holding a huge hypodermic syringe. The fourth therapy mocked here is an injectable treatment for alcoholism, popularized in the 1890s across the country by an Illinois physician, Dr. Leslie E. Keeley, who offered his bichloride of gold solution first in Dwight, Ill., and established residential hospitals to provide the treatment. Keeley's reputation was made nationally after it caught the interest, enthusiasm, and financial support of the temperance-minded editor of the *Chicago Tribune*, Joseph Medill; see Lloyd Wendt, *Chicago Tribune: The Rise of a Great American Newspaper* (Chicago: Rand McNally, 1979), p. 303. Reports on the cure also appeared in *Harper's Weekly*, 3 October 1891, pp. 755-56, and in the *New York Times* (about a dozen items between October 1891 and November 1892). On 18 October 1891, the *Times* devoted four full columns to "The Claims of Dr. Keeley" (p. 17, cols. 3-6). See also a series of six essays, both pro and con, under the rubric "Is Drunkenness Curable?" in three issues of the *North American Review*, September, October, and December 1891, opening with an article by William A. Hammond and closing with a reply by Keeley.

The gold cure came to be widely advertised, including regular placements in *Harper's Weekly*. The *Judge* cartoon cited here was not the only time Keeley's gold cure appeared in a popular satire.

[51](#). There are further indications that contemporaries were beginning to recognize a series. In 1889, for example, an unsigned editorial in the *Medical Age* (a Detroit paper published by George S. Davis and edited by R. W. Palmer) indicated approval of Brown-Séquard ("the claims of a scientist of world-wide reputation, made upon the strength of nearly a quarter of a century of careful honest experimentation") by condemning the rabies vaccine ("the weather-cock assertions of Pasteur, unsupported as they were, and are, by evidence, and based upon no tangible scientific fact"); this writer also acknowledged the press's role: "It is sad to think that the gentleman to whom we are most indebted for our advance in neuropathology and physiology should be the subject of ribald jests, while the emanations of the *Laboratorié [sic] de Rage*, based upon experiments of one day, entirely divested of control, are eagerly snapped up the day following, loudly heralded and widely disseminated" (*Medical Age*, 26 August 1889, p. 372). Then in 1890, when *Frank Leslie's Illustrated Newspaper* editorialized on the importance of Koch's consumption cure, the writer harked back to the Brown-Séquard elixir (6 December 1890, p. 326). By 1894, the series was well established, and references back to the earlier breakthroughs were becoming routine.

[52](#). Since most of the primary sources from that era use the spelling *anti-toxine*, I will here adopt that now-obsolete form (instead of using *antitoxin*, the usual form today) in order to minimize distracting variations between quotations and my writing.

[53](#). In the twentieth century, two exceedingly popular and dramatic accounts were chapter 6 ("Roux and Behring: Massacre the Guinea Pigs") of Paul De Kruif, *Microbe Hunters* (New York: Harcourt, Brace, 1926; frequently reprinted, as recently as 1996); and the diphtheria episode in the Oscar-winning Hollywood film about salvarsan directed by William Dieterle, *Dr. Ehrlich's Magic Bullet* (1940, with Edward G. Robinson and others).

[54](#). A recent article by Paul Weindling tells the international scientific story and cites further literature: "From Medical Research to Clinical Practice: Serum Therapy for Diphtheria in the 1890s," in *Medical Innovations in Historical Perspective*, ed. John V. Pickstone (New York: St. Martin's Press, 1992), pp. 72-83. On the importance of the press and the public in Hermann 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, 1986). See also David Anthony Blancher, "Workshops of the Bacteriological Revolution: A History of the Laboratories of the New York City Department of Health, 1892-1912" (Ph.D. thesis, The City University of New York, 1979); and esp. Evelyn M. Hammonds, "The Search for Perfect Control: A Social History of Diphtheria, 1880-1930" (Ph.D. thesis, History of Science Department, Harvard University, 1993). Recent published accounts include Terra Ziporyn, *Disease in the Popular American Press: The Case of Diphtheria, Typhoid Fever, and Syphilis, 1870-1920* (Westport, Conn.: Greenwood, 1988); 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*, ed. David Rosner (New Brunswick, N.J.: Rutgers University Press, 1995), pp. 155-96. Hammonds's book, *Childhood's Deadly Scourge: The Campaign to Control Diphtheria in New York City, 1880-1930*, (Baltimore: Johns Hopkins University Press, 1999), appeared only after this article was in press. On the commercial developments, see Jonathan M. Liebenau, "Public Health and the Production and Use of Diphtheria Antitoxin in Philadelphia," *Bull. Hist. Med.*, 1987, 61: 216-36; Louis Galambos with Jane Eliot Sewell, *Networks of Innovation: Vaccine Development at Merck, Sharpe & Dohme, and Mulford, 1895-1995* (Cambridge, U.K.: Cambridge University Press, 1995).

[55](#). "The New Remedy for Diphtheria," *Harper's Weekly*, 15 September 1894, p. 867.

[56](#). Ibid.

[57](#). Ibid.

[58](#). "The New Cure for Diphtheria, Croup, etc.," *Sci. Amer.*, 17 November 1894, pp. 308-9; the drawings are captioned "Injecting the Serum," "Preparing the Toxin," and "Drawing the Serum from the Horse."

[59](#). As detailed below, both these particular images and their general subjects were later reprinted in other publications. These three drawings might well be based on engravings or photographs from European magazines (a common practice), but I have not yet found the antecedents. A quite different depiction of a child being injected ("Le croup guéri par le docteur Roux") was published on the cover of *Le Petit Journal: Supplément Illustré* dated 24 September 1894; this was a daily paper, with a pictorial supplement each week. (I am grateful to William Helfand for sending me a photocopy of this print in his collection.) It is also a different composition from that in the French painting by A. Brouillet, *Le vaccine du croup à l'Hôpital Trousseau*, now lost, but well known through a photograph made in 1895: see André Pecker, *La médecine à Paris du XIIIe au XXe siècle* (Paris: Éditions Hervas, 1984), p. 458; a heavily cropped and unidentified reproduction may also be found in Otto L. Bettmann, *A Pictorial History of Medicine* (Springfield, Ill.: Charles C. Thomas, 1956), p. 306. For more on this and other French medical paintings of the era, see Richard E. Weisberg, "The Representation of Doctors at Work in Salon Art of the Early Third Republic in France" (Ph.D. thesis, New York University, 1995).

Two further examples confirm the iconic character of the horses' role. A long article in the *New York Times*, 26 March 1895, p. 3, col. 4, opens with this series of headlines: "'No. 7' A Valuable Horse. Has Furnished the Health Board with 15 Quarts of Antitoxine. Bought for \$10; Worth \$5,000. Gaining Flesh While Losing Blood and Does Not Appear to Be at All Dissatisfied in His New Role." Even decades later, horses are the primary image used to represent the anti-toxine discovery in Robert A. Thom's (widely reproduced) painting *The Era of Biologicals*, which shows three anonymous technicians in white jackets, pants, and hats drawing blood from two horses: see George A. Bender, *Great Moments in Pharmacy: The Stories and Paintings in the Series "A History of Pharmacy in Pictures" . . . by Robert A. Thom*, 2d ed. (Detroit: Northwood Institute Press, with special permission of Parke, Davis & Company, 1967), p. 173. For scholarly analysis, see

Jacalyn Duffin and Alison Li, "Great Moments: Parke, Davis and Company and the Creation of Medical Art," *Isis*, 1995, 86: 1-29.

[60](#). The traditional page of loose type composed of individual letters and separate pictorial blocks was held together in part by the rigid rules dividing the columns; any large image that broke these rules weakened the plate and increased the risk of its falling apart on high-speed rotary presses. When stereotyping was introduced (making a mold and then a cast of the plate) so that the same page could be run simultaneously on several presses, it had the secondary benefit of allowing images to break the column rules without the old danger, and images wider than one column became commonplace. Fig. 6 above shows the postage-stamp-sized images to which newspapers had formerly been restricted when they wanted to mix illustrations with text.

[61](#). *New York Herald*, 10 December 1894, p. 3. Since pages 1-2 of the *Herald* were entirely devoted to classified advertising, page 3 was equivalent to other newspapers' front page.

[62](#). *Ibid.*, 11 December 1894, p. 3.

[63](#). *Ibid.*, 12 December 1894, p. 3.

[64](#). That wide public appreciation of how these horses were saving children's lives might have undermined antivivisection sentiment is not easily demonstrated, but the possibility merits consideration.

[65](#). *New York Herald*, 13 December 1894, p. 3.

[66](#). The first implied the public's possible interest in the hygiene and purity of the preparation: "Every New Horse Is Clipped" (*ibid.*, 17 December 1894, p. 4). The second offered a taste of reality, showing a horse strapped down on its side: "Inoculating a Refractory Horse" (*ibid.*, p. 4)--but the image was very calm; no struggle was evident despite the caption. The third image, "Where Fodder Is Kept" (*ibid.*, p. 4), offered more realistic detail, but might also have raised questions of whether the paper was simply trying to fill space to keep the story big.

[67](#). *New York Herald*, 20 December 1894, p. 10.

[68](#). *Ibid.*, 23 December 1894, sect. 1, p. 6, cols. 3-6.

[69](#). *Review of Reviews*, January 1895, p. 4.

[70](#). "The New Diphtheria Cure," *Leslie's Illustrated Weekly*, 17 January 1895, pp. 43 (text) and 46 (images), had an accurate text, but ran an alarmingly erroneous caption for the picture of treating the baby: "The Method of Injecting the Poison in Order to Obtain Serum." A few weeks later, *Leslie's Illustrated* ran another diphtheria picture (this time without a story) and used an incorrect or misleading caption again: see "The New Treatment for Diphtheria at the Hospital for Sick Children, Paris--*L'illustration*" (one of several images on the Foreign Press page), *Leslie's Illustrated*, 14 February 1895, p.

109, which clearly shows not the new hypodermic injection, but the established intubation operation (in which a seated physician works in the mouth of a baby held on a woman's lap with an attendant standing behind the woman to hold the baby's head steady). Confirmation that this is a portrayal of intubation is offered by a 1904 painting by the French physician Georges Chicotot, *Tubage par Albert Josias entouré de ses élèves*, reproduced in color in Pecker, *La médecine à Paris* (n. 59), p. 264; and by an 1895 American photograph, reproduced in Rima D. Apple, *Illustrated Catalogue of the Slide Archive of Historical Medical Photographs at Stony Brook* (Westport, Conn.: Greenwood Press, 1984), item 2123.

[71.](#) Henry Smith Williams, M.D., "How Antitoxines Are Developed," *Harper's Weekly*, 5 January 1895, p. 8.

[72.](#) This article's statement that the New York Pasteur Institute was already making anti-toxine would place it ahead of the Health Department's far better known effort. The precise relationship of the two efforts (if indeed they are distinct) is difficult to assess--but those particulars are not essential for an appreciation of visual documents widely accessible in the public sphere. For more information on the Pasteur Institutes in several American cities, see Hansen, "America's First Medical Breakthrough" (n. 5), pp. 407-8.

[73.](#) I believe that the sober take on the diphtheria cure probably derives from three factors. First, a consensus about its worth emerged quickly to unite the media, the medical profession, leaders in public health, and the public in support of the discovery and its use. With no public uncertainty about its value, there was less purchase for a satirist's bite. Second, while there was consensus on its value, there was uncertainty about how quickly and widely it could be made available, and some newspapers created a campaign, virtually a crusade, to press the government to act. Graphic art was put into service delivering the miracle therapy to the public, complemented by pleading headlines that called for action and urged the public to support the demand. The serious, almost angry, propaganda of editors and publishers pushed humor to the side. And third, the pathos of sick and dying children--in contrast to the healthy and cheery dog-bite victims of the rabies adventure--also kept the humorists at bay. (For conversations about this point and other aspects of the diphtheria story, I wish to express my appreciation to Evelyn M. Hammonds.)

About the use of humor more generally, it should be noted that satire about breakthroughs was directed almost always toward the public excitement, not toward the scientists themselves--with two exceptions: (1) a very few cartoons where these breakthroughs are associated with "cranks" and patent-medicine "sure cures," and (2) antivivisection caricatures of medical professionals. An example of the former in *Judge* in 1892 was described above in the tuberculin section; for an example of the latter, see a centerfold cartoon, "Turn About Is Fair Play," with animals in an operating theater doing electrical experiments on a man, in *Life*, 12 December 1895, pp. 384-85. *Life* ran many such cartoons; a full-page drawing from the issue of 16 March 1911 (p. 534), "The Little Boy Who Never Grew Up," has recently been reprinted in Lederer, *Subjected to Science* (n. 6), p. 41.

[74.](#) See, for example, E. R. N. Grigg, *The Trail of the Invisible Light: From X- Strahlen to*

Radio(bio)logy (Springfield, Ill.: Charles C. Thomas, 1965); Joel D. Howell, "Early Use of X-ray Machines and Electrocardiographs at the Pennsylvania Hospital, 1897 through 1927," *JAMA*, 1986, 255: 2320-23; Nancy Knight, "'The New Light': X Rays and Medical Futurism," in *Imagining Tomorrow: History, Technology, and the American Future*, ed. Joseph J. Corn (Cambridge, Mass.: MIT Press, 1986), pp. 10-34; J. T. H. Connor, "The Adoption and Effects of X-Rays in Ontario," *Ontario History*, March 1987, 79: 92-107; 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); Lisa Cartwright, "Decomposing the Body: X Rays and the Cinema," chap. 5 of idem, *Screening the Body: Tracing Medicine's Visual Culture* (Minneapolis: University of Minnesota Press, 1995); Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1995); Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New Brunswick, N.J.: Rutgers University Press, 1997); Charles R. R. Hayter, "The Clinic as Laboratory: The Case of Radiation Therapy, 1896-1920," *Bull. Hist. Med.*, Winter 1998, 72: 663-88. Ready access to several good images is also found in L. Pearce Williams, *Album of Science: The Nineteenth Century* (New York: Scribner, 1978). Prominent examples of contemporary magazine coverage include *Scientific American* of 15 February 1896 and *Harper's Weekly* of 22 February 1896. X-ray photographs are found in several *Leslie's Illustrated Weekly* issues in early 1896, including those of 13 February, 27 February, 2 April, and 9 April. Of course, the social satirists working for *Puck* and *Judge* joined in the fun on many occasions. Visual jokes even appeared in stereoviews, such as the composite photograph published in 1896 by Littleton View Co. under the title "Our Latest in X Rays."

[75](#). Starr's book remains the best single account of these nineteenth- and early-twentieth-century developments: Paul Starr, *The Social Transformation of American Medicine* (New York: Basic Books, 1982). Richard Harrison Shryock's much older textbook, *The Development of Modern Medicine: An Interpretation of the Social and Scientific Factors Involved* (1947; reprinted, New York: Hafner, 1969), holds up rather well and should be recognized for its brief but clear acknowledgment of public attention to the publicity surrounding rabies vaccine and other breakthroughs. A recent overview by James H. Cassedy also acknowledges the popular enthusiasm for turn-of-the-century breakthroughs: *Medicine in America: A Short History* (Baltimore: Johns Hopkins University Press, 1991), pp. 84, 86, 97. Also useful--in addition to Lederer, *Subjected to Science* (n. 6), and Tomes, *Gospel of Germs* (n. 6)--are recent essays in *Scientific Authority and Twentieth-Century America*, ed. Ronald G. Walters (Baltimore: Johns Hopkins University Press, 1997), esp. JoAnne Brown, "Crime, Commerce, and Contagionism: The Political Languages of Public Health and the Popularization of Germ Theory in the United States, 1870-1950" (pp. 53-81), and Walters's introduction, "Uncertainty, Science, and Reform in Twentieth-Century America" (pp. 1-10). A recent study of contemporary changes in British medicine provides a useful comparison to some of the developments explored in this article: see Steve Sturdy and Roger Cooter, "Science, Scientific Management, and the Transformation of Medicine in Britain, c. 1870-1950," *Hist. Sci*, 1998, 36: 421-66.

