THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

AND A CHANGE IN THE STATE OF NEW JERSEY'S

ANIMAL EXPERIMENTATION LAWS IN 1915

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ABSTRACT

In 1914, an offer by James J. Hill, president of the Great Northern Railway, to support research on "hog cholera" prompted the Rockefeller Institute for Medical Research (RIMR) of New York to establish a Department of Animal Pathology (DAP), with Theobald Smith as its Director. RIMR opened the new department's facilities near Princeton, New Jersey, even though it was concerned about the restrictions that New Jersey's "Act for the prevention of cruelty to animals" (1880) would place on animal experimentation. During 1914 and 1915, Simon Flexner and Henry James, RIMR's director and manager, worked behind the scenes to amend the law. Although they succeeded in having a bill passed by New Jersey's state legislature, opposition from anti-vivisectionists, including the Brooklyn attorney Frederick P. Bellamy and the Newark veterinarian James C. Corlies, persuaded Governor James Fielder to veto the bill. Newspaper editorials in several states condemned Fielder's veto. Through the efforts of State Senator Austen Colgate and RIMR, the bill was re-written, and Fielder signed it on 6 April 1915. The new law permitted all establishments engaged in biological research in New Jersey to conduct experiments without fear of violating laws safeguarding animals. The law was vital not only to the Rockefeller Institute's research in animal pathology but also to the growth and concentration of the American pharmaceutical industry in New Jersey.

Introduction

An experiment is basically a process that leads to an answer to a question. In science, the answer and the original question are subject to being retested, and the "final word" on the matter may yet to be determined. In innumerable experiments in the biomedical sciences over a very long period of time, the "process" has involved living organisms, including humans. If we accept Altman's contention that "human experimentation began when the first doctors treated the first patients," then, indeed, animal experimentation is an ancient practice.[1] Perhaps the first record (6th century BCE, possibly apocryphal) of an experiment on humans and, perhaps, animals in general—a comparison of vegetarian and meat diets—appears in the Hagiographa's

Book of the Prophet Daniel.[2]

Early Greek physicians and philosophers played a prominent role in the early use of animals in biomedical investigations. The "father of medicine," Hippocrates (ca. 460-ca. 370 BCE) "created an intellectual and philosophical atmosphere that laid the foundation for use of animals for experimental purposes" while the philosopher Aristotle (384-322 BCE), the "founder of biology," carried out comparative anatomy studies through dissections (meaning simply to cut and separate the structures) on presumably dead animals and thereby helped to promote the use of animals in experimentation.[3] Live animals of various species were used by the "founder of physiology," Erasistratus (304-250 BCE).[4] His work included experiments on the nervous, circulatory and digestive systems and how he did his work has led him to be called "the first vivisectionist."[5] Galen (ca. 129-ca.199 AD), a particularly distinguished and influential Greek physician, also used live animals, especially the "Barbarian monkey" (Barbary ape?), for example, to study muscles.[6] Galen achieved fame in his lifetime; his ideas continued to dominate medicine another 1400 years as "the main source of European physicians' knowledge about the human body."[7] His contributions to medicine were, however, "a revered obstacle" to the advancement of animal experimentation until the 16th century and the work of the Flemish anatomist, Andreas Vesalius (1513-1564).[8]

Vesalius was "the most commanding figure in European medicine after Galen and before Harvey."[9] As a result of his dissections of cadavers and his dissections and vivisections of dogs and other animals, he produced the most significant book of Renaissance anatomy, *De humani corporis fabrica*.[10] In 1628, the pathbreaking work on the circulation of blood, published in 1628 by the English physician and physiologist William Harvey (1578-1657) was based on his meticulous work on living animals.[11] In the 19th century, the outstanding work of the French physiologist Claude Bernard (1813-1878) was also dependent on vivisection. Particularly because he introduced controls in animal experimentation, Bernard became known as the "founder of experimental medicine."[12]. He "believed...the only sure way forward in experimental medicine was to design experiments in which every variable was controlled."[13] Furthermore, "the pathological lesion which the clinicians had fetishized was not the ideal *entrËe* to disease, since it [the lesion] was its end-point...pathological processes could best be studied in experimental animals in regulated surroundings."[14]

In the field of experimental medicine, as established by Bernard and the many others who developed the science after him, scientists induce and study diseases in animals for the sake of knowledge that will benefit humans and animals. This ideal was the basis for the establishment of the Rockefeller Institute for Medical Research (hereafter the Institute or RIMR) in New York in 1901. To achieve its goals, experimentation with animals was essential. When RIMR began to set up a new research division in New Jersey, its administrators became concerned that the Institute's independence and research would be threatened by key provisions of the 1880 New Jersey "Act for the prevention of cruelty to animals":

> Nothing in this act contained shall be construed to prohibit or interfere with any properly conducted scientific experiments or investigations, which experiments or investigations shall be performed *only under the authority of some regularly incorporated medical society of this state*; nor shall the same be construed to prohibit or interfere with the killing or disposing of any animal or creature by virtue of the order of any of the constituted authorities of this state [italics added].[15]

To accomplish its own mission, the RIMR vigorously sought changes in that statute. The aim of this paper is to review, drawing primarily on the Institute's own files, the two years of debates in 1914-15 among the interested parties—RIMR, anti-vivisectionists, universities, medical and scientific organizations, government agencies, state legislators, and newspapers — over the issue of biomedical animal experimentation in New Jersey. The outcome was a law that not only permitted the Institute's investigations, but also furthered biological and medical research generally in the state.

Background of the RIMR

On 1 May 1901, a group of men prominent in the American medical community was brought together at the Arlington Hotel in Washington, D.C. to discuss the possibilities of establishing a new medical research organization. Attending this meeting were: Drs. Hermann Michael Biggs, Christian Archibald Herter, Luther Emmett Holt, Theophil Mitchell Prudden, and

William Henry Welch.[16] Welch, the distinguished Professor of Pathology at Johns Hopkins University, chaired the meeting, and Holt was its secretary. They were presented with a letter dated 29 April 1901, from the American businessman and philanthropist John D. Rockefeller, Jr. (Junior) . Junior informed the eminent physicians that his father, John D. Rockefeller, Sr. (Mr. Rockefeller) would provide funds for medical research, "up to an average of twenty thousand dollars ($20,000) a year for ten years," and requested the doctors to serve on a committee that would manage the fund and carry out its goals.[17] Subsequently, Mr. Rockefeller informed Junior that he could make one million dollars available for the next 10 years for Institute buildings and operations.[18]

At a second meeting, held on 10 May 1901, at the University Club, New York, Junior and Theobald Smith, Professor of Comparative Pathology at Harvard University, joined the original group.[19] At this meeting, the physicians decided to name the organization the Rockefeller Institute for Medical Research and constituted themselves as its Board of Directors, with Welch as President; to get the project underway RIMR would initially utilize existing laboratories in the United States and abroad. They also issued an invitation to Welch's former student, Simon Flexner, Professor of Pathology, University of Pennsylvania, to the next meeting.[20]

The Board of Directors hoped that their colleague Theobald Smith would become the director of the Institute and the head of the department of bacteriology; and he was formally asked to "consider under what conditions he would be induced" to assume this position.[21] However, on 11 February 1902, Smith declined the offer because of his attachment to Harvard University and allegiance to the foundation that supported the chair of comparative pathology that he held.[22] Smith's reply to Welch urged the Institute to concentrate on research on infectious disease.[23] In words that became particularly relevant to his decision, twelve years later, to head the Institute's Princeton facility, Smith alluded to the possibility of controversy over experimental work with animals:

> my interest for years in animal pathology and my firm belief in its great usefulness in the study of problems in human pathology might give an impress to the work of the laboratory which might eventually arouse adverse criticism. Taking these various things into consideration, I believe that my usefulness in the more restricted sphere I now

> occupy would be greater than in the new and untried though very promising field opened by the founding of the Rockefeller Institute.[24]

Smith was being realistic. The issue of animal and human experimentation did demand RIMR's attention throughout the early years of the Institute; and it must be remembered that highly publicized controversies in New York and other states, in Congress, and in Great Britain formed a backdrop to the events in New Jersey recounted in this paper.[25]

Welch then wrote to Simon Flexner for his views on the future physical structure and organization of the Institute. In his extensive reply, dated 8 April 1902, Flexner expressed his opinion that "the scope of the Institute should be broad enough, when fully organized, to cover the entire field of medical research in respect both to men and animals."[26] He also said that, if the Institute provided freedom and beneficial opportunities for medical science research, he would accept the directorship of the Institute if it were offered to him.[27] Shortly after that, Flexner was elected Director of the Institute and began to devote himself full-time to this position as of 1 July 1903 at a salary of $10,000 per annum.[28] Now, with Flexner, the Institute's first Board of Directors was complete (Fig. 1).

The Certificate of Incorporation of the RIMR declared: "The purpose of the Corporation is Medical Research with special reference to the Prevention and Treatment of Disease."[29] The Institute's focus was clarified further in a detailed report of its activities for 1901-1902:

> While the study of the diseases of the lower animals is highly important both from an economic point of view and from their bearing upon the understanding of many forms of human disease, and while the work of the Institute will of necessity be largely experimental, yet intimate relation with the problems of human disease should not for a moment be lost sight of.[30]

The Certificate of Incorporation also stated that the RIMR would be located in but not limited to New York City. This suggests that, from the start, the Board envisioned the possibility of expanding outside New York. Indeed, within just a few years the Institute recognized that its

researchers needed to maintain large animals and to use them in ways that could not be readily done in New York City—horses for serum production and dogs for Alexis Carrel's physiological experiments for example.[31] On 13 April 1907, the Board approved a search for a suitable farm to be bought with funds from Mr. Rockefeller who had pledged $12,000 for such a property. Two months later, on 13 June, the Board was informed that a farm, of 97.5 acres, owned by J.A. Nugent, had been found in Clyde, New Jersey, 3.5 miles from New Brunswick. The sale was completed and the deed recorded on 8 November 1907 in Somerset County.[32]

In 1913, an unusual opportunity for research on a nonhuman disease spurred the Institute to take another look at animal experimentation and its New Jersey research operations. It was thought that this could be accomplished by adding land adjoining the farm but other plans prevailed.[33]

James Hill, Hog Cholera, and the RIMR

On 22 October 1913, Simon Flexner reported to the RIMR's Board of Scientific Directors (BSD) that the founder and president of the Great Northern Roailroad, James J. Hill, had offered to contribute $25,000 to the Institute's farm program for research on hog cholera, a disease that was causing a great economic loss in the West—and consequently to Hill's railroad.[34] The following month, Flexner informed the BSD that he a
nd Theobald Smith, who had a long-standing interest in hog cholera, had discussed the matter and the possibility of establishing a department of animal pathology in the Institute.[35] While the Rockefeller Institute's Executive Committee (EC) turned down Hill's offer, it turned to Theobald Smith to find out what a hog cholera study would require.

It should be noted that at this time hog cholera was also widespread in New Jersey. In 1913, there were foci of infection in six counties and a large number of hogs died.[36] In order to control the disease, Frederick C. Minkler, Live Stock Commissioner of the New Jersey Department of Agriculture and Professor of Animal Husbandry at Rutgers College, had successfully requested the Committee on Resolutions of the State Board of Agriculture to propose legislation to permit the quarantining and treatment of infected swine. Whether or not Hill, Smith, or the members of the EC had taken these facts into consideration is not clear.[37]

Smith was asked by the EC to submit a plan for a Department of Comparative Pathology and Animal Diseases.[38] By January 1914, the BSD was considering his plan and his appointment as the director.[39] The Board of Trustees decided it wanted a department of animal pathology even if there were no offer of support from Hill and requested a preliminary budget.[40] On 11 March, responding to Smith's estimate—$30,000 to $35,000—the BSD agreed that, should this be acceptable to the Trustees, Smith would be invited to become the Director of the Department of Animal Diseases as of 1 July 1914 with a salary of $10,000 a year.[41] Hill raised his offer to $50,000, and the EC was now willing to accept it for a hog cholera study if the Board of Trustees gave its final approval for the department and Smith's appointment.[42]

In April, Smith agreed to assume the position of Director of the Department of Animal Pathology (DAP), as it was to be officially called, and his letter of acceptance was forwarded to the Trustees.[43] Smith did, however, oppose the implied restriction of Hill's donation, and the Board accepted his point that the term, "hog cholera," should be taken as referring to all acute infectious diseases of swine.[44]

Now that the BSD had the director it wanted, it turned its attention to a site and facilities for the DAP. Drawing on the experience at the Clyde farm, it sought a larger tract of land "in a community in which its staff will find congenial association."[45] It was felt that a desirable place would lie between Princeton and New Brunswick, that is, convenient to Princeton University, Rutgers University, and the New Jersey Agricultural Field Station.

However, on 18 April 1914 the Board noted that, if New Jersey laws did not permit the DAP's work to be conducted without encumbrances, New York State would be reexamined for suitable sites. The BSD's caution reflected its awareness of antivivisectionist efforts over the previous half-dozen years and particularly during the winter and spring of 1914. Six years earlier, on 31 December 1907, Flexner had asked a prominent New Brunswick attorney about state regulations that could affect animal experimentation. Willard P. Voorhees, who had just been appointed to the New Jersey Supreme Court, responded immediately on (3 January, 1908) by sending the relevant sections of New Jersey law.[46]

In essence, regulation of animal experimentation in New Jersey as a function of the state came through statutes concerned with the protection of animals. New Jersey had first officially become a party to such codes on 3 April 1868 when the legislature approved a Public Law that

incorporated the New Jersey Society for the Prevention of Cruelty to Animals.[47] The Society's mission was to implement the local animal protection laws then in operation or that might be promulgated in the future. The Act gave the Society and its representatives the authority to use the police to administer the laws that protect animals. On 11 March 1880 the Senate and General Assembly had enacted a revision of these statutes; this included the provision that permitted animals to be used in "scientific experiments" but only under the control of a state-approved medical society. These were the laws that Voorhees had sent to Welch in 1908 and that the Institute had begun to confront in the winter and spring of 1914.[48]

Despite this unresolved issue, RIMR's Executive Committee proceeded to finance the new department, using a gift of one million dollars from Mr. Rockefeller "for securing land, buildings and equipment." The gift came with the stipulation that money not used for those purposes would go into the Institute's general funds.[49] The EC also went forward with preparation of a detailed budget for the DAP and gave its approval for Smith's operations. The Board adopted resolutions that thanked Mr. Rockefeller for his generosity and to Hill for his financial support for hog cholera research and agreed that the new department's first project would be on swine infectious diseases generally.[50]

At the 13 June 1914 meeting of the Board, Flexner reported that he had met with the governor of New Jersey to discuss the state's law on animal experimentation which, as things stood, would obstruct the work of the DAP. To change the regulations and legitimize the Institute's work, Welch said that he and the Institute manager would draft a bill to be given to the New Jersey legislature at its next session.[51] In the interim, the Institute went forward with its plans for obtaining land and constructing facilities at Princeton and allotted funds for the breeding and housing of pigs.[52]

The RIMR and Assembly Bill No. 486

Behind the June 1914 meeting with New Jersey's governor, James F. Fielder, lay several months of behind-the-scenes lobbying on the part of Flexner and Henry James, Flexner's administrative assistant and the Institute's business manager. On 24 February 1914, James wrote to Princeton University Professor of Biology Edwin Grant Conklin about the prevention of

cruelty to animals laws in New Jersey.[53] James was particularly concerned about the provision that required animal experiments to be " 'performed only under the authority of some regularly incorporated medical society.' " Assuming that Conklin and other Princeton faculty carried out experiments on animals, he asked "Do you simply go ahead [with the experiments] or have you obtained authority? If the latter can you tell me from what society you obtained it and in what form."[54]

James also wrote to the Secretary of the Medical Society of New Jersey, Harry A. Stout:

> to ascertain...how it is customary to give such authority [for animal experimentation]? Has your society ever been called upon to confer authority in this respect? If so, how do you do it? Can you give me the names of any experimenters or laboratories upon whom you have conferred authority?[55]

Stout replied that he could not provide him with the information he requested.[56]

At this point, the Institute became more directly involved with the issue: the New Jersey legislature was proposing new legislation on animal experimentation. On 25 February 1914, Mr. William Hughes, Assemblyman of Passaic County, introduced a bill, No. 486, that called upon the Governor to:

> create a commission to investigate and report upon the condition of the practice of human and animal experimentation in the State of New Jersey to show what regulations are necessary to prevent cruelty to human beings or animals; and likewise to prevent any abuse of or interference with the private rights of human beings in our charitable institutions and elsewhere, by experimentation upon them except by due authority and consent.[57]

The bill was referred to the Committee on Public Health.

After hearing about the proposed legislation, James wrote to the Clerk of the Senate and Clerk of the Assembly in Trenton and requested copies of this bill, the hearing date, and the name of the Committee that would handle the bill.[58] He also wrote to the New Jersey State

Board of Health and pointed out that the Hughes bill was of interest because, while experimentation had not started at the farm, it was desired to begin such work.[59] In reply, the secretary of the Board, Jacob C. Price, on 9 March 1914 sent James a copy of the bill as he had requested but he could not tell him the status of the bill.[60]

With Bill No. 486 now in the hands of the Committee on Public Health, James wrote on 10 March to a past President of the Medical Society of New Jersey, Dr. Norton L. Wilson, and stated his opinion that this bill had, in fact, been drawn up by a Mr. F. B. [sic] Bellamy of the Society for the Prevention of the Abuse in Animal Experimentation (SPAAE). James observed that the bill had been previously before the New York Legislature:

> where we have had a couple of hearings, and [he] has supported it largely by sensational stories of so-called "human vivisection." I think it is a matter in which not only New Jersey laboratories are interested but also New Jersey hospitals for it would authorize a state wide inquiry into hospitals by a commission on which there would probably be two cranks at least. I should like to be present at the hearing myself and I have been trying to find out who in New Jersey is interesting himself in the matter. The Secretary of the New Jersey State Society pays no attention to my repeated letters nor to the inquiries of the New York Academy of Medicine, and he cannot be reached by telephone. I hope Dr. Townsend is right in saying that you are interested in this matter and that I am not trespassing on your good nature in asking you to inform me about it.[61]

Wilson replied to James on 11 March.[62] He wrote that he was not familiar with the bill in question and suggested that James write to Dr. Henry B. Costell of Linden, Chairman of the Committee of Public Hygiene and Legislation, and to Dr. Henry A. Cotton, Director of the New Jersey State Hospital, Trenton, and ask them to help defeat the bill, which he hoped would take place. He also gave James the names of the members of the Public Health Committee.

In a letter to the president of the State Medical Society, Dr. Enoch Hollingshead of Pemberton, James expressed his opinion that anti-vivisectionists, "who have unfounded complaints about animal and human experimentation," were fostering Bill No. 486 which should be "vigorously opposed."[63] He urged Hollingshead to bring about measures that would defeat the

bill. James also sent Hollingshead literature issued by the Committee on Defence of Medical Research of the American Medical Association and other information to help stop the proposed legislation.[64]

On 13 March, Hollingshead replied to a separate letter from Flexner regarding Bill 486.[65] He informed Flexner that he had forwarded his letter to Costell and requested he attend to the matter immediately and to write to Flexner about it. Hollingshead wanted to be more informed about this matter and asked Flexner to send him literature.

James wrote again to Stout asking if he knew the bill's hearing date and if the Medical Society would be represented.[66] Stout informed James on the 13th that his letter had been forwarded to Dr. L. M. Halsey of Williamstown, Chairman of the Legislative Committee for the State Society and that he, Stout, is not familiar with the subject.[67]

Halsey, however, was acquainted with past and currently proposed legislation and wrote to James:

> Several years ago we had passed a bill incorporating Anatomical and societies for Medical Research. There is a very old law upon the statutes of N.J. giving the State Medical Society to [sic] right to incorporate district medical societies for the study of medicine and giving them certain definite powers. Several anatomical societies are working at present. I think Dr. Edward J. Lee of Newark could give you some information to regard to one there. I am having an investigation made in regard to Mr. Hughes bill. It may pass but we will try and control it in the senate. However, we have a very good man in the senate that I am convinced could dictate the committee. There is a very decided objection at present to appoint any investigating committee owing to the finances of the state. I have instructed my man to see if it is possible to grant a hearing.[68]

Assistance in the Institute's cause now came from J.W. Prince of Columbia University. He informed Flexner on 14 March that he had written to New Jersey State Senator William E. Ramsay, a physician in Perth Amboy, Middlesex County, to enlist his aid in defeating Bill 486 and that he had enclosed Flexner's letter.[69] He suggested Flexner should also write to Ramsay. Prince expected Ramsay's cooperation, pointing out that Ramsay, “although a Democrat, always

supported me in my pro-medical fights in former years" and that Ramsay "has a good idea of what medical science is and is not a man likely to be moved by maudlin howls." However, Prince couldn't guarantee what Ramsay would do: "I speak of him as I knew him—of course, you can never tell about a politician who may want reelection!"[70] Prince did not think the anti-vivisectionists would be successful in New Jersey and said that he would go to Trenton on 30 March to make his own observations.

Cotton also did not think the bill had a "ghost of a chance" particularly because of the physicians in the Senate and Committee on Public Health.[71] He admitted, however, that while he paid close attention to legislation, he had missed this one. Cotton assured James that he would do whatever he could to forestall passage of such laws and that he would keep James informed of anti-vivisection legislation.

Indeed, it appeared that by 18 March 1914, Bill 486, which had been promoted by anti-vivisectionists, was dead. Halsey wrote to James on that date that the chairman of the Committee on Public Health (i.e., Costell) had informed him that the bill would be put aside and not presented to the Assembly.[72] A separate letter from Ramsay, a fellow-member of the committee, to James suggested that, although he believed that anti-vivisection legislation would be defeated in New Jersey, this desired outcome could not be guaranteed.[73]

While James "could hardly believe that a bill for an investigation into experimentation could pass," understandably, he was pleased to receive the information provided by Halsey.[74] In his reply to Halsey, James also warned New Jersey's physicians "that this bill is an attempt to 'slip something over' in a state in which the medical profession is not on the look out for such legislation."[75]

Opposition to Animal Experimentation

SPAEE's major spokesperson was its secretary-treasurer, Frederick P. Bellamy. He worked energetically and eloquently to publicize and carry out SPAEE's goals. His efforts in New Jersey had begun several years before the introduction of Bill 486 to the New Jersey Assembly; in 1908, Bellamy had clarified the position of the SPAAE in answer to letters from physicians:

> The doctors assume that we are *anti*-vivisectionists and that we do not understand or appreciate the benefits derived from animal experimentation. No greater misapprehension of our position could be possible. Every document that we have issued and every measure that we have favored demonstrates that we are not *anti-vivisectionists* in any sense of the word.[76]

Bellamy continued with a 1895 quotation from Herbert Spencer:

> "We consider as wholly unjustifiable, the common practice of subjecting animals to torture in the laboratory or class-room merely for the purpose of demonstrating well-known and accepted facts. We hold that the infliction of torment upon a living animal under such circumstances, is not justified by necessity, nor is it a fitting exhibition for the contemplation of youth. We believe, therefore, that the common interests of Humanity and Science demand that Vivisection, like the study of human anatomy in the dissecting-room should be brought under the direct supervision and control of the state."[77]

In 1907 and 1908, the SPAAE had been involved with legislative matters in the State of New York—a precursor to their later arguments in the State of New Jersey— "simply to bring about some legislation which shall protect legitimate scientific work while it prevents any *unnecessary cruelty* and ignorant abuse."[78]

At the end of 1908 Bellamy had circulated a defense of the SPAAE 's platform (23 December 1908), written in response to a letter published in newspapers from Frank Van Fleet, the chairman of the Legislative Committee of the Medical Society of the State of New York:

> Dr. Van Fleet's letter begins by deliberately confusing this Society [SPAEE], which is endeavoring to secure a law protecting legitimate vivisection in the hands of scientific men, and merely preventing its abuse, with a society of practical "Anti-Vivisectionists" who are opposed to almost all work of the kind...The fact is, however, that the almost insuperable obstruction which some of those engaged in vivisection have placed in the way of the disclosure to the public of any definite or clear idea of what they are doing to

> protect animals against unnecessary cruelty in their closely guarded laboratories, is one of the principal reasons for the existence of this Society.[79]

Bellamy thought the apparent decline in publicized cases of animal cruelty was due only to the scientists' secretiveness and the inability of outsiders to inspect laboratories and see what was being done to living animals. In fact, he welcomed Van Fleet's letter; it was an opportunity for the SPAAE to have medical societies scrutinized for their views of animal experimentation practices and seek answers to the questions the Society had posed. to "fully protect legitimate scientific work." Bellamy went on to say:

> To-day we insist, and are prepared to prove by the best legal authorities in this State [New York] that the practice of vivisection is as open and unrestricted to the most incompetent or ignorant dabbler who claims to be doing vivisection work, as to the most learned or expert scientist in the land. We challenge the learned physician [Frank Van Fleet] who wrote this letter to produce any law which requires the use of anaesthetics, even in the most painful of vivisection operations, or which limits the practice of vivisection in this State to the expert or competent practitioner.[80]

Bellamy asserted that 700 physicians, including many members of the Medical Society of New York supported laws limiting animal experimentation; with so significant a number of medical and scientific professionals persuaded by SPAEE's position, he argued, its views should at least be heard by anyone concerned with the proposal and enactment of relevant laws.[81]
Six years later, when Bellamy also became a spokesperson for the New Jersey Vivisection Investigation Society (NJVIS), an organization opposing animal experimentation legislation, he made similar points. About the time that Bill 486 came under discussion in February 1914, a major figure in the wider vivisection debates disputed Bellamy's arguments, facts, and methods. R. M. Pearce, Jr., Professor of Medical Research at the University of Pennsylvania, had just published the American Medical Association's pamphlet defending human experimentation. In a letter to Bellamy, Pearce accused Bellamy of misrepresenting both Pearce's and SPAEE's positions in public statements: "You say you are not an anti-vivisectionist, but your printed

statements (and those in the literature of your Society) show the same misrepresentation of, and disregard for facts, as does the literature of the various avowedly antivivisection societies."[82] Referring to a Bellamy article that had appeared in the *Chicago Examiner* of 14 December 1914 concerning a court case, Pearce wrote:

> As I am one of the persons under indictment, as I know that both statements (in quotation marks) are false and, furthermore, do not appear in the indictment or the court records, I am forced to the conclusion that you have made no attempt to verify these statements and that your methods are not different from those of avowed antivivisectionists and other opponents of modern humane effort in medical practice and research.[83]

The adversarial positions that had been articulated during New York's discussions of animal experimentation legislation continued in New Jersey as more such proposals for regulation came before its legislature.

The RIMR and Senate Bill No. 339

On Tuesday, 31 March 1914, Mr. Austen Colgate presented to the New Jersey Senate Bill No. 339 that would amend Section 17 of the Act for the Prevention of Cruelty to Animals of 1880.[84] Colgate's revision was aimed at broadening the kinds of organizations that could oversee research on animals. In addition to the societies mentioned in the 1880 law, Colgate proposed to allow "some corporate body, wherever incorporated, having by its charter power to conduct investigations into the nature and causes of disease and the method of its prevention and treatment" to undertake animal experiments. [85]

This legislation was challenged by several organizations located within and outside the State: the NJVIS; New Jersey Humane Society [of Pennington]; New Jersey Society for the Prevention of Cruelty to Animals; Vivisection Investigation League of New York; and the International Anti-vivisection Society.[86]

Colgate's proposed legislation was completely processed on the same day it was presented, Tuesday, 31 March 1914, in both the Senate and House of Assembly.[87]

On Tuesday, 7 April 1914, the approved and certified Bill 339 was delivered to Governor

James F. Fielder.[88] What followed was further delay in the Institute achieving its legislation objectives in New Jersey.

Governor Fielder's Veto of Bill No. 339

The day after Bill 339 was approved by both houses, the *Newark Evening News* reported that this would be one of three bills on which Fielder would hold hearings on Monday, 13 April. It had been reported that the bill had been signed; but, in fact, Fielder did not sign it in deference to anti-vivisectionists, and he wanted to hear different opinions about the bill's contents.[89]

Both sides of the issue were presented at that meeting. Bellamy was a representative of the Newark-based NJVIS. He offered the view that Bill 339 "would open the doors for wholesale abuses on the part of irresponsible and incompetent persons, involving not only experimentation upon animals, but upon human beings."[90] Fielder pointed out that the proposed legislation did not include or authorize human experimentation. In his response, Bellamy said that this was the problem, that it was not realized that animal experimentation, which the bill would permit, would lead to experimentation on humans.

The president of the NJVIS, Dr. James C. Corlies, a Newark veterinarian, amplified Bellamy's statements by "saying that where the use of serum [derived from animal inoculation] had been introduced disease has increased."[91] He warned "that the Rockefeller Institute would seek to practice in New Jersey upon human beings as it has elsewhere."[92] Corlies also complained that the bill had moved too rapidly through the legislature—all in a single day—and in a secretive fashion that did not give the public the opportunity to examine it and voice opinions. Other NJVIS speakers asserted that Rockefeller Institute finances "make possible vivisection and animal experimentation...which have resulted in the most inhuman cruelty."[93]

The secretary of the American Institute of Social Service, M.J. Whitty of New York, also spoke at this meeting. While he was in favor of genuine research, he felt the bill's breadth would permit unqualified persons to carry out animal studies.[94]

The *Newark Evening News* noted that Dr. Richard Cole Newton of Montclair, president of the State Board of Health, Dr. B. [sic] C. English, editor of the *New Jersey Medical Journal*, Dr. Samuel [sic] Flexner of the RIMR, and Dr. Jacob T. [sic] Lipman, Director of the

Agricultural Experiment Station, New Brunswick, had spoken in favor of the bill; it summarized at some length the statements by Mr. Starr J. Murphy of Montclair, Mr. Rockefeller's personal counsel.[95] Murphy pointed out that the generalities of the bill prevented the label of "special legislation." On the matter of the bill's speedy passage, he noted that the Institute already had a farm in New Jersey and wanted to begin experimentation there as soon as possible. He had contacted Senator Colgate on 30 March in hopes of insuring the passage of the bill and making Mr. Rockefeller's gift of one million dollars for animal experimentation a reality before the legislature's anticipated adjournment date of 2 April 1914. In answer to Bellamy's remarks about five University of Pennsylvania physicians being indicted "for maiming dogs," Starr said that this showed the value of and need for laws to make investigators accountable. He reiterated that the Institute's research would help alleviate human and animal diseases and that, in turn, would bring economic benefits, the great monetary loss from hog cholera being a case in point.[96]

The next day, Tuesday, 14 April, six days after Bill 339 was presented to Fielder, S. Edward Hermann, the governor's secretary, sent James a note informing him that the governor had vetoed the bill.[97] He also sent him a copy of the governor's veto message:

> Under the present law scientific investigations and experiments on animals can only be conducted when authorized by a regularly incorporated medical society of this state. The change this law proposes is to permit any corporation, incorporated for the purpose under the laws of any state or country, to conduct such investigation and experiments, without any supervision whatever. This right might safely be given to the Rockefeller Research Institute, but it would be unwise to confer it upon such irresponsible persons who could obtain it by merely incorporating themselves.[98]

On this same day, a report and an editorial on the governor's action appeared in the *Newark Evening News*.[99] Both pieces noted that the governor, by having accepted some of Bellamy's arguments, had given great pleasure to the anti-vivisectionists. The editorialist approved the intent of the Institute, pointed out the strong support the Institute had from the vast majority of physicians and scientists, and opined that "The opposition has been largely

sentimentally hysterical."[100]

Fielder's rejection of Bill 339 was also reported in other local and out-of-state newspapers under eye-catching headlines and with, perhaps, some incorrect information. It is not clear where the reporter for *The Daily Home News* of 14 April had learned that the bill was:

> designed to permit the Rockefeller Research Institute to establish on the *State Agricultural Experiment Farm, at New Brunswick,* an institute for the study of diseases in animals, though it was admitted at the hearing that diseases of man would also be studied [italics added].[101]

The governor's action made the front page of *The New York Times*, which pointed out that the governor's disapproval of the Colgate bill would prevent the Institute from carrying out its plan in New Jersey.[102] While the governor had listened to presentations arguments for and against the bill, he had accepted those by the anti-vivisectionists whose major representative was Bellamy. Bellamy, it was noted, was acting for the NJVIS and had been involved in a prior proposed New Jersey piece of legislation (Bill No. 486, described above). He had emphasized the broad scope of Bill 339 and stated, among other negative comments, that "it would permit the vivisection of human beings in addition to animals."[103] The article noted added that Flexner and others had argued the reverse: both humans and animals would benefit by the Institute's studies. However, as a *New York Times* editorial the next day noted, Governor Fielder:

> was told, too, that his signature would enable any little group of men to incorporate for the purpose of inflicting torture, however horrible their motives or useless the results. And this last plea, strange as it may seem is the one which the Governor apparently based his veto of the bill.[104]

The reporter in *The Daily Times* (New Brunswick, NJ) of 14 April stated that Mr. Rockefeller's support (the one million dollars) of the new Institute division was now "ineffective," and it would be so "at least for a time," implying that the matter was not closed forever.[105] The article also drew attention to Hill's gift (of $50,000) and his motives, namely the financial loss (60 million dollars) to farmers due to hog cholera. It seems to this writer that such

statistics from western farmlands did not move the governor of an eastern state, The *Garden* State, known, at least at that time, for its agriculture. (Italics for emphasis)

The next day's editorial in *The Daily Times* patched together quotations from other newspapers and with which it agreed. From *The Philadelphia Ledger*:

> Are not the anti-vivisectionists of New Jersey somewhat over sympathetic in their opposition to the law which permits the Rockefeller Institute of Medical Research to establish a branch for the prosecution of its work in this state? To trace out the diseases of animals that are communicable to mankind and to determine practical treatment for such diseases in animals is the service of this institute to humanity and the lower species.[106]

And from *The New York Times*: "it is incomprehensible that the Governor should have paid any attention at all to the pumped-up horror that marks every mention by the anti-vivisectionists of testing new drugs and operations on human beings."[107]

Surprise by Fielder's action was expressed in a 16 April article in the *Democrat and Chronicle* of Rochester, New York. The writer felt that the purpose of "The Institute of Animal Research was...legitimate...and it is a pity that the bill to permit it to conduct investigations in New Jersey was not so drafted that no criticisms could have been made on its provisions."[108]

The Columbus [Ohio] *Dispatch* took a strong position on the veto on 18 April saying that "The Governor has been deceived by the anti-vivisectionists."[109] The editor pointedly stated that "there is no objection to the sacrifice of animal life that there may be food;" and with regard to using humans in experiments, "we have that already in much of the medical practice" in, for example, the selection of drugs for the best treatment. The *Dispatch* concluded that, while New Jersey was rejecting medical research, other states would allow it and New Jersey's citizens would be the beneficiaries.

The Press of New York City was very sympathetic with the objectives of Bill 339. Calling the situation "The Vivisection War," an editor observed on 24 April that "living animal(s)...die so that children may live" and called into question laws that prevent the use of a tool, that is, animal research, necessary for scientific advancement.[110]

Further Study and a New Rockefeller Proposal

Drafting a new legislative proposal was now necessary if the Institute was to continue with its plans for a DAP in New Jersey.[111] There were now some doubts that the department would become a reality; James wrote on 4 June 1914 to Conklin that: "We are not yet sure whether we now want to undertake experimental work in New Jersey, but one consideration which may influence us is our chance of obtaining legislation."[112] James pointed out that "at present" animal experimentation "at Princeton is against the law." and revision of the current law was not only necessary for the Institute but for other institutions in New Jersey as well. He proposed:

> to find out this month whether Princeton, Rutgers, and the Board of Health, and three or four influential members of the Legislature can be induced to agree with us on a legislative programme for next year. In the absence of such an agreement I do not see how we can go on with our plans at present.[113]

Seeking more information to support the Institute's goal, James followed this letter to Conklin with one to David C. English in New Brunswick requesting a "list of institutions in New Jersey in which medical and pharmaceutical studies are carried on," including the two schools of pharmacy in Jersey City.[114]

It was quite possible that even the State's own institutions were breaking the law and carrying out vivisection. Flexner noted in a letter dated 5 October 1914 to Senator Ramsay that surely the New Jersey Department of Health and the Agricultural Station "must maintain laboratories and employ some animals" and would, therefore, "operate outside the provisions of the (1880) act."[115] He enclosed a copy of a proposed amendment to the 1880 statutes that would "cover the needs of modern medicine and biology" and, at the same time, "safeguard the interests of the State."[116] This new proposal to amend Senate Bill No. 339, written by the RIMR, removed the reference to "corporate body, wherever incorporated"—to which Fielder objected and helped lead him to veto the original bill—and made other changes in the language that would

make the bill more acceptable to both the Governor and the Institute, if not the NJVIS, SPAEE, and their supporters:

> which experiments or investigations shall be performed only under the authority of some regularly incorporated medical society of this State, or Board of Health of this State, or of a college or university or philanthropic institution incorporated under the laws of the State of New Jersey, for the purpose of conducting investigations into the nature and causes of disease, and the methods of its prevention and treatment,[117]

The Institute must have had confidence in the ultimate success of the revision because, even before it was enacted, Smith gave the Board of Trustees preliminary plans for buildings at the farm and they allotted $750.00 for the breeding and housing of pigs.[118] Flexner told the BSD on 11 February 1915 that the bill on animal experimentation was under review by the New Jersey legislature; the EC gave its approval to Smith's plans for his department on 25 March.[119]

Senate Bill No. 108: Introduction and Debate

On 25 January 1915, Colgate presented Senate Bill 108, a major revision of his earlier bill (339) to amend the existing act on animal experimentation.[120] The Senate committee to which the bill was referred held a hearing on 15 February; among those who attended were Corlies and Seiwright who spoke against the bill and Conklin, Murphy, and Flexner spoke in favor of it.[121] As the bill's sponsor, Colgate spoke first. He reviewed the history of Bill 339 and stated his belief that, in its new form Bill 108, with its placement of regulatory power in the State Board of Health, it should now satisfy Fielder's objections.[122]

Corlies's remarks are of particular interest because he used clinical data as one basis for objecting to grant the Institute the legislation sought by the Institute ("where every crack and crevice is guarded and nothing is allowed to come out").[123] Concentrating on the Institute's work on hog cholera and foot and mouth disease Corlies claimed:

> There have been several hundred serums, as I understand it, made by the Rockefeller

> Institute and there are very few, possibly a dozen or two, now in use. All the rest are in the scrap heap, leaving behind them weakness and death and ruination. So much for those serums...there has been a gradual increase in it [hog cholera] year after year and in the last three years since the Rockefeller stuff has been used it has developed more intensely...and these serums...sold to farmers have killed off many thousands of their hogs.[124]

Citing examples from farmers, even one who saw the decline in the number of hogs a benefit in because prices for hogs rose, Corlies argued that the sera produced cholera rather than prevented it and, moreover, caused foot and mouth disease.[125]

In his testimony, Conklin pointed out that fleas are animals and that, "if you send an electric current through one [an animal] you are performing an animal experiment."[126] He used this curious example to highlight difficulties that might be encountered with the existing law where "no animal experimentation of any sort is permitted except after we get the permission of the medical board."[127] Bill 108 would remove this obstacle to a researcher's projects and, therefore, its passage was essential.

Corlies had earlier asked why the RIMR wanted to be in New Jersey and change the law. Murphy responded:

> This is an amendment simply intended to bring the practice of New Jersey up to date so that our institutions located here can carry on their work under the full protection of the law. Why is the Rockefeller Institute coming to New Jersey? In order to carry on the work of experimentation we have been given a gift of one million dollars for that purpose. It is necessary to have a large area...you can't have a farm in the City of New York...our sole purpose in asking for legislation is to enable our institutions to come here.[128]

In his remarks, Flexner first related the story about Hill and his offer of financial support for hog cholera research. While this had initially been rejected, studying the diseases of animals that were of economic importance was seen as a good idea, especially since Mr. Rockefeller

would make money available if the right person were in charge of the program. It was felt that Theobald Smith was the only person; with his acceptance of the appointment, Mr. Rockefeller made his gift. As to the location of the laboratories, Flexner enlarged on Murphy's comments:

> There is, however, one reason why New Jersey is peculiarly suitable for the establishment of such an institution. It is an agricultural state largely. It has, as Professor Lipman has told you, coped with the very large problems already, with respect to the economic diseases of animals...New Jersey is a little warmer than New York [that is, upstate New York where the necessary land would be available and affordable] and we would have, as it were, a larger open period for our work.[129]

To Corlies's remark about the laboratories being closed for inspection by the general public, Flexner said: "As a matter of fact, what these people mean by inspection when they talk about it is their inspection" He referred to them as "people who have no professional knowledge" and, therefore, not able to properly evaluate the work being done.[130]

> Speaking also for the opposition, Seiwright raised some important issues:
> The question is, is the money of the Rockefeller Institute to be brought in here to tell the New Jersey legislature how experiments shall be conducted or shall the State of New Jersey reserve to itself the right, as it has in the several kinds and classes of legislation where it has sought to license anybody to do anything, the right to regulate it, and not a word has been said about that—not even my friend Murphy who has an office in New York and lives in New Jersey. Can the State of New Jersey afford to license and not reserve to itself the right to regulate?[131]

According to Seiwright, if Bill 108 became law, the state agency that was to regulate animal experimentation in New Jersey, the Board of Health, would be powerless to do so.

This bill was processed through the Committee on Miscellaneous Business and, despite some compelling arguments by the opposition at the hearing on 15 February, by 31 March it had been approved by both the Senate and the Assembly.[132] On or before Tuesday, 6 April, the bill was in the hands of Governor Fielder.

The New York Times reported that the Colgate bill had been signed by Fielder on the night of 6 April 1915, and that the RIMR would now be able to build its animal research department "near the State College in New Brunswick."[133] This was followed by an editorial that noted the one million dollars provided by Mr. Rockefeller would be utilized for valuable research and that the kind of research the investigators in the new laboratories might undertake could be envisioned from the major contributions of the director, Theobald Smith, to human and veterinary medicine.[134]

In its review of the highlights of the approved legislation and what the Institute may now do in the state, *The Newark Evening News* had a major error: "James J. Hill had donated $300,000 to be used in...research work relating to hog cholera."[135] Such an amount does not appear in any of the archives or literature this writer has reviewed. In the event, Hill died (about a year later, on 29 May 1916), without fulfilling any pledge he had made to the Institute; apparently, after his death, no one else followed through on his proposal.[136] Although the donation never took place, Hill's offer should be recognized for the motivation it gave to the RIMR for developing and putting into operation the DAP.

What Fielder signed had become law in New Jersey, and its published wording was the same as Senate Bill 108.[137] However, the new law still presented some problems; and, to deal with them, Flexner decided to speak directly with Fielder. On 16 June 1915, the two had a cordial meeting during which Flexner reviewed the legislative history of animal experimentation proposals and "alluded with satisfaction to his [Governor Fielder's] signing the bill."[138] However, Flexner pointed out, "the same "forces" engaged in obstructing the bill in the legislature were now engaged in endeavoring to thwart its dealings with the Board of Health"[139] The Institute had submitted an application to the Board of Health for permission to conduct animal experimentation; but, in order to study diseases wherever they happened to occur, the

application was not limited to the Princeton facilities. Those objecting to the Institute's application wanted the experimental work to be confined to the laboratories, something that the Board of Health had the power to require. Fielder informed Flexner that, as of 1 July 1915, the current Board would be replaced with new members. It would, therefore, be advantageous for the Institute to withdraw its current application and resubmit it to the new Board.[140] It appears that is what was done, with satisfactory results for the RIMR.

The RIMR In Princeton

With the New Jersey laws and arrangements favorable to animal experimentation in place, the Institute could now move ahead more freely with its plans for the new DAP. A farm of 425 acres near Princeton and east of Lake Carnegie was purchased and the construction of buildings was approved.[141] While waiting for the buildings to be ready for use in the fall of 1916, the DAP research program got underway in 1915 in Princeton University laboratories.[142] Not long after that, the size of the RIMR property in Princeton was enlarged to approximately 800 acres.[143] The addition of that space proved a wise move: in 1931, the BSD added a division of plant pathology to the campus, and a single Department of Animal and Plant Pathology was established (Fig. 2) under the directorship of Carl TenBroeck.[144]

Closing of the RIMR in Princeton and Conclusion

Over the next three decades, the Rockefeller Institute for Medical Research in Princeton was an exceptional scientifically productive institution; its researchers' achievements included the 1946 Nobel Prize in Chemistry.[145] By 1947, however, the Institute decided that, to avoid duplication of activities and equipment, it would be administratively and financially prudent to end operations at Princeton and consolidate them with the New York laboratories.[146] About half of the research staff went to New York by the closure date, September 1950. Others took positions elsewhere, retired, or died by that time.[147]

With the consolidation in New York, the mission and administration of the Institute underwent major changes. In 1953, it became a doctor of philosophy-granting institution with

the physiologist/biophysicist Detlev Bronk as president and with a single administrative board chaired by Junior's son, David Rockefeller. The Institute was renamed "Rockefeller University" in 1965.[148]

The Institute's physical presence in New Jersey was gone but the revision of the state's animal experimentation laws early in the twentieth century it brought about has had a continuing positive effect on the state's academic and commercial institutions. New Jersey now has medical schools and institutes that are recognized centers for biological and medical research.[149] In the United States, New Jersey leads in the production of pharmaceuticals and justly calls itself "Medicine Chest of the Nation."[150] Eleven of the 25 largest pharmaceutical companies have their national or world-wide headquarters in that state. In 2002, over one-third of FDA-approved drugs and biologics were developed in New Jersey. In the newer field of biotechnology, New Jersey is fourth in the number of such companies,—116—in the nation.[151]

It is, of course, impossible to say if and when these educational and scientific institutions and the economic benefits the state has derived from them would have come about and flourished had the state's animal experimentation regulations not been changed in 1915; these changes might well have come about at a later date under different auspices. But it was the Rockefeller Institute for Medical Research that took on the challenge and succeeded in changing the law. The Institute and its administrators (along with the governor and legislators of New Jersey) should, then, be acknowledged for their role in the reformation of New Jersey's animal experimentation laws and thereby contributing to the current well-being of the state's citizenry and government.[152]

Notes

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Abbreviations for Rockefeller Archive Center materials:

A-V = Anti-vivisection

BM = Biographical Material

CP = Confidential Papers

Legis = Legislative Matters - New Jersey

MBSD = Minutes of the Board of Scientific Directors, RIMR

News Clips = News Clips re Princeton, box 16, folder (16)4

UH = University History

RF = Rockefeller Family

RG = Record Group in the Rockefeller Archive Center,
Sleepy Hollow, New York
RU = Rockefeller University Collection

1. Lawrence K. Altman, *Who Goes First: The Story of Self-Experimentation in Medicine*. (Berkeley and Los Angeles: University of California Press, 1998), 14. See Kenneth F. Kiple and Kriemhild ConeË Ornelas "Experimental Animals in Medical Research: A History," in Ellen Frankel Paul and Jeffrey Paul, Eds., *Why Animal Experimentation Matters: The Use of Animals in Medical Research*, New Brunswick (USA): Transaction Publishers, 2001), 23-48.

2. Vera Hassner Sharav, "Human Experiments: A Chronology of Human Research," *Alliance for Human Research Protection*, New York, http://www.ahrp.org/history/chronology/php, 26 October 2007. Sharav is apparently referring to the Book of Daniel, 1:3-5, 8, 11-13: "The king told Ashpenaz, his chief chamberlain, to bring in some of the Israelites of royal blood and of the nobility...such as could take their place in the king's palace...The king allotted them a daily portion of food and wine from the royal table...But Daniel was resolved not to defile himself with the king's food or wine...Then Daniel said to the steward.... "Please test your servants for ten days. Give us vegetables to eat and water to drink...Then see how we look in comparison with the other young men who eat from the royal table." "The Book of the Prophet Daniel," Cross Publications, Savannah, GA, http://biblescripture.net/Daniel.html, 26 October 2007. Sharav's date for the writing of this book is open to question. See "Book of Daniel," Wikipedia, http://en.wikipedia.org/wiki/Book_of_Daniel , 26 October 2007.

3. Anonymous, "Introduction to Laboratory Animal Health Management," Purdue University School of Veterinary Medicine Veterinary Technology Program, West Lafayette, IN, http://www.purdue.edu , then search School of Veterinary Medicine, Veterinary Technology Program and type http://www.vet.purdue.edu/vettech. Then make a search for this title and click on "Cached Page" to add to that URL /vm204/Lab Animal Introduction.doc. 13 January 2008.

4. Anonymous (n. 3).

5. Rita Leal Paixao and Fermin Roland Schramm, "Ethics and animal experimentation: what is debated?" *Cadernos de SaÀde PÁblica*, Vol. 15, Suppl. 1, Rio de Janeiro, 1999.

http://www.scielo.br. Then add to that:
scielo.php?script=sci_arttext8pid=so102-311X1999000500011. 26 October 2007. The word "vivisection" literally means cutting the *living* and has been in use since at least 1707. J.A. Simpson and E.S.C. Weiner, eds., *The Oxford English Dictionary*, 2d ed., vol. XIX (Oxford: Clarendon Press, 1991), 717. Today, vivisection refers to dissection or surgical procedures on live *but anaesthetized* (or not if absolutely necessary for the experiment) animals in studies of physiological and disease processes [italics for emphasis]. However, "vivisection" was and still is commonly applied to animal experimentation in general although, of course, not all such work involves cutting. Clarence L. Barnhart, ed. *The World Book Dictionary*, vol. 2 (Chicago: Field Enterprises Educational Corp., 1967), 2185; Mary Louise Westermann-Cicio, *Of Mice and Medical Men: The Medical Profession's Response to the Vivisection Controversy in Turn of the Century America* (Ph.D. diss., State University of New York at Stony Brook, 2001), 9.

6. Paixao and Schramm (n. 5).

7. Brad D. Hume, "Galen of Pergamum: Beyond Galen's Lifetime," *Chronology of the History of Science,* http://campus.udayton.edu/~hume/Galen/galen.htm. 26 October 2007.

8. Daniel J. Boorstin, *The Discoverers*, (New York: Random House, 1983), 344.

9. Fielding H. Garrison, *An Introduction to the History of Medicine with Medical Chronology, Suggestions for Study and Bibliographic Data*, Fourth Ed., (Philadelphia: W.B. Saunders, 1929), 217.

10. Garrison (n. 9), 218. See also Roger Kenneth French, *William Harvey's Natural Philosophy*, (New York: Cambridge University Press, 1994), 27-29, through http://www.google.com/books. 26 October 2007.

11. Boorstin (n. 8), 364. Harvey's book was titled *De motu cordis sanguinis in animalibus* (On the Motion of the Heart and Blood in Animals).

12. Garrison (n. 9), 545.

13. "Claude Bernard: World of the Body," Oxford University Press, http://www.answers.com/topic/claude-bernard?cat=health, 23 October 2007.

14. Roy Porter, *The Greatest Benefit to Mankind: A History of Humanity*, (New York: W.W. Norton, 1997), 339.

15. New Jersey Legislature, "General Public Laws of New Jersey, Session of 1880,

Chapter CLVII, An Act for the prevention of cruelty to animals," 11 March 1880, *Acts of the One Hundred and Fourth Legislature of the State of New Jersey* (Morristown: Vance and Stiles, 1880), 212-25. : Section 17 (p. 223) states: "That nothing in this act contained shall be construed to prohibit or interfere with any properly conducted scientific experiments or investigations, which experiments or investigations shall be performed *only under the authority of some regularly incorporated medical society of this state*; nor shall the same be construed to prohibit or interfere with the killing or disposing of any animal or creature by virtue of the order of any of the constituted authorities of this state." [Italics for emphasis]. The Institute probably also feared that the New Jersey medical society would not be scientifically qualified to oversee the RIMR's research.

16. Biggs was a pathologist and Professor in the University and Bellevue Hospital Medical College, New York; Herter a physician and clinical pathologist in New York; Holt a professor of diseases of children and Prudden Professor of Pathology in the College of Physicians and Surgeons of Columbia University in New York; Welch was Professor of Pathology, Johns Hopkins University, Baltimore. *Who's Who in America* (Chicago: A.N. Marquis), vol. 1903-1905, 120, 689, 719, 1201, 1578.

17. "First Preliminary Meeting," 1 May 1901, MBSD, RIMR, 1901-1906, RG 110.2, 1.

18. "Special Meeting," 14 June 1902, MBSD, RG 110.2, 80-81.

19. "Second Preliminary Meeting," 10 May 1901, MBSD, RG 110.2, 3. By this time, Theobald Smith was a highly regarded human and veterinary medical scientist with internationally recognized accomplishments in, for example, the transmission of Texas cattle fever and comparative studies of the bovine and human tubercle bacillus. He was a member of the Rockefeller Institute Board of Directors from its inception in 1901 until his death in 1934 at the age of 75. See the curriculum vitae (undated) prepared by Smith for Mr. Rockefeller, "Corporation Biography," RAC, RG Theobald Smith, sub-series 199.82, box 1, folder BM.

20. "Second Preliminary Meeting," 10 May 1901, MBSD, RG 110.2, 3. Simon Flexner studied pathology under William H. Welch at Johns Hopkins University, Baltimore, and taught and carried out research in bacteriology and pathology there. At the time of this invitation, he was Professor of Pathology at the University of Pennsylvania and had made major contributions to the knowledge and management of such diseases as dysentery, bubonic plague, and polio. He

died in 1946 at the age of 83. John A. Garraty and Edward T. James, eds., *Dictionary of American Biography* Suppl. Four 1946-1950 (New York: Charles Scribner's Sons, 1974), 286-9.

21. "Regular Meeting," 11 January 1902, MBSD, RG 110.2, 29. The Board of Directors existed until 1910; then two administrative bodies were formed: the Board of Trustees, to deal with the Institute's business matters, and the Board of Scientific Directors (BSD), to supervise its scientific operations. Elizabeth Hanson, *The Rockefeller University Achievements: A Century of Science for the Benefit of Humankind, 1901-2001* (New York: Rockefeller University Press, 2000), 22.

22. "Regular Meeting," 11 January 1902, MBSD, RG 110.2, 31. Personal communication from Brian A. Sullivan, Reference Archivist, Harvard University Archives, Cambridge, MA, 1 May 2001. In 1896, George F. Fabyan donated $100,000 to Harvard University to establish, in his father's memory, the George Fabyan Foundation for Comparative Pathology. George Fabyan was a medical doctor who attended Harvard in 1843-44. Seymour E. Harris, *Economics of Harvard* (New York: McGraw-Hill, 1970), p. 471, and Harvard University, "Endowment Funds of Harvard University 30 June 1947," (Cambridge: Harvard University, 1948), 260.

23. "Special Meeting," 8 March 1902, MBSD, RG 110.2, 32.

24. "Special Meeting," 8 March 1902 (n. 23), 33-36.

25. "Annual Meeting," 12 April 1902, MBSD, RG 110.2, 45.

26. "Annual Meeting," 12 April 1902 (n. 25), 52.

27. "Regular Meeting, " 25 October 1902, MBSD, RG 110.2, 91.

28. Flexner served as Director of the Institute from 1 July 1903 through 30 September 1935. George W. Corner, *A History of the Rockefeller Institute, 1901-1953. Origins and Growth* (New York: Rockefeller Institute Press, 1964), 324.

29. The Certificate of Incorporation of the Rockefeller Institute for Medical Research was recorded in the State of New York on 14 June 1901. "Certificate of Incorporation, 28 May 1901," RG 417.1, UH CP, 1904-1959, box 1, folder 5, UH CP, Charter/By-Laws.

30. "Report and Recommendations of the Directors of the Rockefeller Institute for the year 1901-1902," MBSD, RG 110.2, 65. The quotation is in a detailed report on the Institute's activities for 1901-1902 and proposals for the future development of the Institute that were sent

to Mr. Rockefeller.

31. Corner, (n. 28) *Rockefeller Institute*, 133.

32. Untitled document, RG 417.1, folder 6, UH CP, Clyde Farm in New Jersey. The initial price was $10,000; Mr. Nugent lowered it to $9,000 and then accepted the Institute's offer of $8,750. On 29 July 1907, Mr. Rockefeller was asked for the sum he had pledged.

33. "Adjourned Meeting," 11 October 1913, MBSD, RIMR, October 1911-July 1917, 64.

34. "Regular Meeting of the Executive Committee," 22 October 1913, MBSD, 1911-1917, 66. James J. Hill (1838-1916) was the founder and president of the Great Northern Railway, a prime transporter of livestock. Hog cholera is a highly contagious viral disease of swine with the primary feature of generalized hemorrhages. Its discovery in Ohio in 1833 occurred at the time of an outbreak of Asiatic cholera in humans and the term "cholera" was mistakenly attached to the pig ailment. The disease, native to America, spread to Europe where it came to be known as "swine fever." With the deaths of many hogs, the farmers lost income and with a decline in animals to transport, Mr. Hill's railroad lost money. Christopher Muller, "James J. Hill," http://www.railserve.com/JJHill.html, *Rail Serve*, 28 October 2007 and Neal Black, "Chapter 5—Hog Cholera," in *United States Animal Health Association History — Animal Health A Century of Progress*, http://www.usaha.org/AnimalHealth-ACenturyofProgress.pdf. 28 October 2007.

35. "Regular Meeting of the Executive Committee," 12 November 1913, MBSD, 1911-1917, 67. Theobald Smith and Daniel Salmon, then at the Bureau of Animal Industry, had reported in 1885 that hog cholera was caused by the bacterium *Bacillus cholerae-suis* (subsequently renamed *Salmonella cholerae-suis*). This was proven to be incorrect by de Schweinitz and Dorset when they established the disease's viral etiology. E.A. de Schweinitz and M. Dorset. *A Form of Hog Cholera Not Caused by the Hog Cholera Bacillus*, Circular 41, United States Department of Agriculture (Washington, 1903). Cited in Hilton A.Smith and Thomas C. Jones, *Veterinary Pathology*, (Lea and Febiger: Philadelphia, 1961), 325.

36. Franklin Dye, "Report of State Board of Health on Various Animal Diseases," *Proceedings of the Forty-First Annual Meeting of the New Jersey State Board of Agriculture*, 1914, 181. (Dispatch Printing Company: Union Hill, 1914).

37. Dye (n. 36), 168.

38. "Executive Committee Meeting," 17 December 1913, MBSD, 1911-1917, 70.

39 "Regular Quarterly Meeting," 10 January 1914, MBSD, 1911-1917, 73.

40. "Executive Committee Meeting," 5 February 1913, MBSD, 1911-1917, 76.

41. "Executive Committee Meeting," 11 March 1914, MBSD, 1911-1917, 79.

42. "Executive Committee Meeting," 11 March 1914 (n. 41), 80.

43. "Quarterly Meeting," 18 April 1914, MBSD, 1911-1917, 84. As Director of the Department of Animal Diseases, Smith was to first organize the department and then guide and supervise its operations. Although he had doubts about his qualifications for the appointment, Smith accepted the offer in a letter to Henry James, Jr., manager of the RIMR, dated 16 April 1914. "Corporation Biography," RG Theobald Smith, sub-series 199.82, box 1, folder Correspondence 1905-1914. Smith served as Director of the Department of Animal Pathology and Member of the Institute until his retirement on 1 July 1929. Curriculum vitae (undated) prepared by Smith for Mr. Rockefeller, "Corporation Biography," RG Theobald Smith, sub-series 199.82, box 1, folder BM.

44. "Quarterly Meeting," 18 April 1914, MBSD, 1911-1917, 86.

45. "Quarterly Meeting," 18 April 1914 (n. 44), 87.

46. Willard P. Voorhees to Simon Flexner, 3 January 1908, RF, RG 2, Rockefeller Boards, Box A-V Feeder 538, Folder A-V 1908-1921. Voorhees (1851-1914) had just begun a term of office as a justice of the New Jersey Supreme Court that was to end in 1915. *Who Was Who in America* (Chicago: A.N. Marquis, 1943), vol. 1 (1897-1942), 1282.

47. New Jersey, *General Statutes of New Jersey*, vol. I, Animals, "I. Prevention of cruelty to animals. An act to incorporate the New Jersey society for the prevention of cruelty to animals," (Jersey City: Frederick D. Linn and Co., 1896), 32. The above date of 3 April 1868 for approval of this Public Law is from the statutes; the year 1867 is given in Emily Stewart Leavitt and Diane Halverson, "The Evolution of Anti-cruelty Laws in the United States," in *Animals and Their Legal Rights: A Survey of American Laws from 1641 to 1990* (Washington, D.C.: Animal Welfare Institute, 1990), 4.

48. *Acts*, (n. 15).

49. "Executive Committee Meeting," 30 April 1914, MBSD, 1911-1917, 88. See also letter from John D. Rockefeller, Jr., to the Board of Trustees, 16 April 1914, RU, RG 417.1, UH

CP, 1904-1959, box 1, folder 14, UH CP, Princeton Dept. Animal Pathology.

50. "Quarterly Meeting," 13 June 1914, MBSD, 1911-1917, 94.

51. "Quarterly Meeting," 13 June 1914 (n. 50).

52. "Executive Committee Meeting," 2 December 1914, MBSD, 1911-1917, 104. Flexner reported that the purchase of a tract of 300 acres at Princeton was almost completed. Also, "Quarterly Meeting," 16 January 1915, MBSD, 1911-1917, 109.

53. Henry James to Edwin G. Conklin, 24 February 1914, RU, RG 600-1, A-V, Box 6, folder 11, Legis. It is interesting to note that James left the RIMR to serve in the Army in World War I; he wrote a 1930 Pulitzer Prize-winning biography of the former president of Harvard University, Charles W. Eliot; served as the chief officer of the Teachers Insurance and Annuity Association; the novelist Henry James was his uncle; and his father, William James, the distinguished psychologist. Corner, (n. 28) *Rockefeller Institute*, 72-73.

54. James to Conklin (n. 53).

55. Henry James to Harry A. Stout, 24 February 1914, RU, RG 600-1, Legis.

56. Harry A. Stout to Henry James, 10 March 1914, RU, RG 600-1, Legis.

57. New Jersey Legislature, "Assembly, No. 486," 25 February 1914, by William Hughes, RU, RG 600-1, Legis. Hughes was an Assemblyman from Passaic County.

58. Henry James to Clerk of the Senate and Clerk of the Assembly, Trenton, N.J., 7 March 1914, RU, RG 600-1, Legis.

59. Henry James to the New Jersey State Board of Health, 7 March 1914, RU, RG 600-1, Legis.

60. Jacob C. Price to Henry James, 9 March 1914, RU, RG 600-1, Legis.

61. Henry James to Norton Wilson, 10 March 1914, RU, RG 600-1, Legis. Letters similar to that sent to Wilson were also sent to Drs. Henry B. Costell and Henry A. Cotton, Director, N. J. State Hospital, Trenton, and to Dr. William E. Ramsay, Perth Amboy. The RIMR had to contend with anti-vivisectionists beginning in October 1907 when the Institute began operations in Clyde, N.J. Corner, (n. 28) *Rockefeller Institute*, 84. The SPAAE was located at 204 Montague Street, Brooklyn, and received support from the Hearst newspaper chain and the *New York Herald*. Susan E. Lederer, *Subjected to Science Human Experimentation in America Before the Second World War*, (Baltimore: Johns Hopkins University Press, 1995), 77.

62. Norton Wilson to Henry James, 11 March 1914, RU, RG 600-1, Legis.

63. Henry James to Enoch Hollingshead, 11 March 1914, RU, RG 600-1, Legis. For a well-documented history of "human experimentation," see Lederer, *Subjected to Science* (n. 61).

64. In response to the protests against the animal work of institutions such as the RIMR and the anti-vivisectionist activities of lay and professional (including physicians) persons in legislative matters, the A.M.A. created the C.D.M.R. in 1907 and 1908. Susan E. Lederer, "The controversy over animal experimentation in America, 1880-1914," in Nicolaas A. Rupke, ed., *Vivisection in Historical Perspective,* (New York: Croom Helm, 1987), 249.

65. Enoch Hollingshead to Simon Flexner, 13 March 1914, RU, RG 600-1, Legis.

66. Henry James to Harry A. Stout, March 1914, presumably the 12th as given in Stout's reply, cited in n. 67.

67. Harry A. Stout to Henry James, 13 March 1914, RU, RG 600-1, Legis.

68. L.M. Halsey to Henry James, 14 March 1914, RU, RG 600-1, Legis.

69. J.W. Prince to Simon Flexner, 14 March 1914, RU, RG 600-1, Legis. Henry James had written earlier to Ramsay; see n. 61.

70. Prince to Flexner (n. 69).

71. Henry A. Cotton to Henry James, 17 March 1914, RU, RG 600-1, Legis.

72. L.M. Halsey to Henry James, 18 March 1914, RU, RG 600-1, Legis.

73. William E. Ramsay to Henry James, 17 March 1914, RU, RG 600-1, Legis.

74. Henry James to L.M. Halsey, 23 March 1914, RU, RG 600-1, Legis.

75. James to Halsey (n. 74).

76. F.P. Bellamy to Dear Sir, 14 December 1908, RU, RG 600-1, A-V, Box 3, folder 9, SPAAE. This is a 4-page circular letter in answer to letters received from physicians who responded, apparently negatively, to a previous circular letter by Bellamy.

77. Bellamy to Sir (n. 76). According to Bellamy, this quotation is from a statement Spencer wrote and, with "200 of the most prominent physicians in England," signed in 1895.

78. Bellamy to Sir (n. 76).

79. Frederick P. Bellamy to Dear Sir, 23 December 1908, RU, RG 600-1, Box 5, folder 18, A-V.

80. Bellamy to Sir (n. 79).

81. Bellamy to Sir (n. 79).

82. R.M Pearce to Frederick P. Bellamy, February 1914 (date not known), a typed copy with hand-written corrections, RU, RG 600-1, A-V, Box 3, folder 9, SPAAE. Richard Mills Pearce, Jr. (1874-1930) was a pathologist and medical educator. At the time of this correspondence, he was professor of research medicine at the University of Pennsylvania. In 1920, he was appointed general director of the Division of Medical Education of the Rockefeller Foundation. *Who Was Who in America* (n. 47), 948.

83. Pearce to Bellamy (n. 82).

84. New Jersey, "Senate, No. 339," 31 March 1914, by Mr. Colgate, RU, RG 600-1, Legis. Austen Colgate (1863-1927) was a New Jersey State Senator from Essex County and a member of the family that established and operated the Colgate Company (soaps and perfumes) in Jersey City. "Colgate Family," *Collections of the New Jersey Historical Society*, Newark, NJ.

85. The original wording of that part of Section 17 of concern here is given above in n. 15. Colgate's amendment would be between the phrases "medical society of this state" and "nor shall the same be construed."

86. The names of these organizations are typed onto a copy of Senate No. 339 under a heading, "Opposed by:" RU, RG 600-1, Legis. In reply to a telephone call from Henry James, David S. Crater, the Secretary of State of New Jersey from 1912-1915, wrote that he could not find records for "the NEW JERSEY HUMANE SOCIETY, the NEW JERSEY VIVASECTION (sic) INVESTIGATION SOCIETY, nor the INTERNATIONAL ANTI VIVASECTION (sic) SOCIETY. (Capitals as in original letter) David S. Crater to Henry James, 9 April 1914, RU, RG 600-1, A-V, Box 1, folder 11, Correspondence. For a review of opposition to animal experimentation in the United States, see Lederer, *Vivisection* (n. 61), 236-58.

87. New Jersey Legislature, *Journal of the Seventieth Senate of the State of New Jersey Being the One Hundred and Thirty-Eighth Session of the Legislature* (Trenton: MacCrellish and Quigley, 1914), 578, 595, 598, 639, 678. New Jersey Legislature, *Minutes of Votes and Proceedings of the One Hundred and Thirty-eighth General Assembly of the State of New Jersey, 1914* (Trenton: MacCrellish and Quigley, 1914), 1187-1188.

88. New Jersey Legislature, (n. 87), *Journal*, p. 707. James Fielder (1867-1954) was a graduate of Columbia Law School and practiced law in Jersey City. A Democrat, he entered

politics, served in the State Assembly (1903-1907) and the Senate (1907-1913). He was elected president of the Senate in January 1913 because it was then known that Governor Woodrow Wilson would be leaving that position to assume the presidency of the United States and Fielder would then become acting governor. He ran in the 4 November 1913 election for governor, won, and served the 1914 to 1917 term. Paul A. Stellhorn and Michael J. Birkner, *The Governors of New Jersey 1664-1974 Biographical Essays* (Trenton: New Jersey Historical Commission, 1982), 183-6, and *Who Was Who in America*, (Chicago: A.N. Marquis, 1960), vol. 3, 280.

89. "Anti-Vivisectionists to Oppose Rockefeller Bill," *Newark Evening News*, Wednesday, 8 April 1914, 8.

90. "Rockefeller Bill Called Dangerous. Anti-Vivisectionists See the 'Trail of the Serpent' in Animal Experimentation," *Newark Evening News*, Monday, 13 April 1914, 8.

91. "Rockefeller Bill" (n. 90). Dr. James C. Corlies, whose office was at 240 Market Street, Newark, was instrumental in developing the professionalism of veterinarians in New Jersey. He served as the temporary president of the Veterinary Medical Association of New Jersey that was organized on 5 February 1884, and, then, president of the New Jersey State Veterinary Society. The latter was established on 4 August 1887, splitting off from the former in order to have as its members "Only graduates, in good standing, from some Veterinary College or University having power by law to grant diplomas..." Ray Thompson, *The Feisty Veterinarians of New Jersey Their First One Hundred Years* (Rockaway, NJ: New Jersey Veterinary Medical Association, 1984), 13, 16. Interestingly, the current New Jersey Veterinary Medical Association uses 1884 as the year of founding.

92. "Rockefeller Bill" (n. 90).

93. "Rockefeller Bill" (n. 90).

94. "Rockefeller Bill" (n. 90).

95. "Rockefeller Bill" (n. 90). The article has errors: English's first name was David; that of Flexner was Simon, and Lipman's middle initial should have been G for Goodale.

96. "Rockefeller Bill" (n. 90).

97. S. Edward Hermann to Henry James, 14 April 1914, RU, RG 600-1, Legis.

98. Carbon copy of Governor Fielder's Veto Message on Senate Bill No. 339, RU, RG

600-1, Legis. There is no date or signature/name on this document.

99. "Animal Research Measure Vetoed Too Broad, Says Governor Fielder in Disapproving of the Rockefeller Institute's Bill," *Newark Evening News*, Tuesday, 14 April 1914, 5.

100. "Veto of the Rockefeller Bill," *Newark Evening News*, Tuesday, 14 April 1914, 6.

101. "Vivisection Bill Vetoed by Fielder Measure Would Permit Foreign Medical Societies to Experiment on Animals—Governor Sees Danger," *The Daily Home News* (New Brunswick, NJ), 14 April 1914, (page not recorded in file copy), RU, RG 600-1, A-V, News Clips.

102. "Bars Rockefeller Branch. Gov. Fielder Vetoes a Bill to Extend Medical Institute to Jersey," *The New York Times*, 14 April 1914, 1.

103. "Bars Rockefeller Branch" (n. 102).

104. "Enemies of Science Victorious," *The New York Times*, 15 April 1914, 12.

105. "Rockefeller Can't Vivisect in Middlesex Governor Vetoes the Bill Which Would Permit the Rockefeller Research Institute to Establish Institution Here," *The Daily Times* (New Brunswick, NJ), 14 April 1914, (page not recorded), RU, RG 600-1, A-V, News Clips.

106. "Mr. Rockefeller's Turndown," *The Daily Times* (New Brunswick, NJ), 15 April 1914, (page not recorded), RU, RG 600-1, A-V, News Clips.

107. "Mr. Rockefeller's Turndown" (n. 106).

108. "Rockefeller Bill Vetoed," *Democrat and Chronicle* (Rochester), 16 April 1914, (page not recorded), RU, RG 600-1, A-V, News Clips.

109. "No Medical Research in New Jersey," *The Columbus Dispatch* (Columbus), 18 April 1914, (page not recorded), RU, RG 600-1, A-V, News Clips. One would expect Ohioans to have a special interest in John Davison Rockefeller's enterprises. Born in Richford, New York in 1839, he moved with his family in 1853 to Cleveland. He grew up, went to school, and began his business career and married life in Cleveland. His son, John Davison Rockefeller, Jr., was born in Cleveland in 1874. Peter Collier and David Horowitz, *The Rockefellers An American Dynasty* (New York: Holt, Rinehart and Winston, 1976), 3-30.

110. "The Vivisection War," *The Press* (New York), 24 April 1914, (page not recorded), RU, RG 600-1, A-V, News Clips.

111. In the RAC, there is a copy of the Senate-printed Bill 339 with typed and hand written suggestions for revising it and a typed draft of a proposal by Flexner for amending Section 17 of the Act of 1880 (RU, RG 600-1, Legis.). There is also a letter concerning the wording of an amendment to Section 655 of the New York State Penal Code. The language proposed for that may have served as a basis for the revisions of the New Jersey law. Starr J. Murphy to Simon Flexner, 21 March 1908, RF, RG 2, Rockefeller Boards, Box A-V, Feeder 538, Folder A-V 1908-1921.

112. Henry James to Edwin G. Conklin, 4 June 1914, RU, RG 600-1, Legis..

113. James to Conklin (n. 112).

114. Henry James to David C. English, 27 June 1914, RU, RG 600-1, Legis. These two schools of pharmacy were, in fact, one institution with one name in 1910 (University of the State of New Jersey) and another (College of Jersey City) in 1915. A "third" school, the New Jersey College of Pharmacy, was established in 1892 in Newark and remained there when, in 1927, it became part of Rutgers University in New Brunswick. David L. Cowen, *Medicine and Health in New Jersey: A History*, vol. 16, The New Jersey Historical Series (Princeton: D. Van Nostrand, 1964), 134-5.

115. Simon Flexner to William Ramsey, 5 October 1914, RU, RG 600-1, Legis.. As noted, the letter is addressed to "Dr. Ramsey." However, the correct spelling is "Ramsay" as given in the *Journal of the Medical Society of New Jersey*, June, 1916, 294.

116. Flexner to Ramsey (n. 115).

117. The original phrase in Bill 339, "which experiments or investigations shall be performed only under the authority of some regularly incorporated medical society of this State, or of some corporate body, wherever incorporated, having by its charter power to conduct investigations", was changed to read "which experiments or investigations shall be performed only under the authority of some regularly incorporated medical society of this State, or Board of Health of this State, or of a college or university or philanthropic institution incorporated under the laws of the State of New Jersey, for the purpose of conducting investigations into the nature and causes of disease, and the methods of its prevention and treatment," (RU, RG 600-1, Legis.). Compare to earlier suggestions for amending Section 655 of the New York State Penal Code: "which experiments shall be performed only under the authority of a college, hospital or

laboratory incorporated under the laws of this state, or under the authority and subject to the provisions of a license granted by the State Commissioner or (sic) Health or the Board of Health of a city." See n. 111.

118. "Quarterly Meeting," 16 January 1915, MBSD, October, 1911-July, 1917, 109.

119. "Executive Committee Meeting," 11 February 1915, MBSD, October, 1911-July, 1917, 110, 116.

120. Colgate's new bill, Senate No. 108, did not have the phrase "of some regularly incorporated medical society of this State" that was in Flexner's proposal (see n. 111); it also broadened the sites where animal experimentation could take place . The part of Section 17 of the Act of 1880 of concern here now read: "which experiments or investigations shall be performed only under the authority of the Board of Health of the State of New Jersey, the said Board of Health being hereby granted power to authorize the conduct of such experiments or investigations by agricultural stations and schools maintained by the State or Federal government, medical societies, universities, colleges and philanthropic institutions having among their corporate purposes investigation into the causes, nature and mode of prevention and cure of diseases in men and animals, incorporated or authorized to do business in this State; and to revoke for cause the authority so granted." (See n. 15, New Jersey Legislature).

121. "Hearing on Senate Bill #108 before Senate Committee Held Monday, February Fifteen, Nineteen Hundred and Fifteen at Two O'Clock P.M." A typescript, RAC, RU, RG 600-1, A-V, box 1, folder 12, Hearings. This may be the only extant copy; the New Jersey State Library does not have a copy. The name of the committee is not on this document but from another source (see n.) it probably was the Committee on Miscellaneous Business. No first name or position has been found for Seiwright.

122. "Hearing on Senate Bill #108" (n. 121), 1.

123. "Hearing on Senate Bill #108" (n. 121), 21.

124. "Hearing on Senate Bill #108" (n. 121), 22.

125. "Hearing on Senate Bill #108" (n. 121), 23-24. It is not within the scope of this paper to verify and discuss Corlies's data and damning statements about the RIMR, but they should be read today with some understanding of the history of immunization against hog cholera and what is entailed in the development and production of effective biologics. Protection

of pigs by inoculations to produce immunity began years before the Institute was approached by James Hill to work in this field, the first practical immunization procedure (inoculating hyper immune serum and then the virus) being derived in 1907. It took years to produce a killed virus vaccine (1935) and a commercially-produced modified live virus vaccine licensed by the USDA (1951). However, such live virus materials are hazardous and, in fact, as Corlies had said, were themselves responsible for a large percentage of the cases that occurred. Vaccination was discontinued and a disease eradication program instituted by U.S. national law in 1961. See the ARS Research Timeline Story on Hog Cholera Eradication, History of Research at the U.S. Department of Agriculture and Agricultural Research Service, and Diana Murphy Jordan, "Hog Cholera: A Historical Review," *Veterinary Heritage* 21 (1998): 3-5.

126. "Hearing on Senate Bill #108" (n. 121), 51. Conklin was not being facetious in citing the flea because his own research, where animals were involved, was devoted to invertebrates (insects and gastropods) and protochordates. See Princeton University Libraries' finding aid, Edwin Grant Conklin Papers, http://libweb.princeton.edu/libraries/firestone/rbsc/aids/conklin.html. Prior to the passage of Bill 108, Princeton faculty engaged in vertebrate animal studies that involved dissection of preserved specimens. See Princeton University, *Bibliography of Princeton Faculty Publications* (Princeton: Princeton University), Vol. 1913-31).

127. "Hearing on Senate Bill #108" (n. 121), 51.

128. "Hearing on Senate Bill #108" (n. 121), 60.

129. "Hearing on Senate Bill #108" (n. 121), 67-69.

130. "Hearing on Senate Bill #108" (n. 121), 69. Bellamy had also complained about the inability to gain access to laboratories for the purpose of inspection (see n. 79). While he, as an attorney, may not have had the background to make an intelligent inspection, one would expect that Corlies, as a veterinarian, would have.

131. "Hearing on Senate Bill #108" (n. 121), 71.

132. New Jersey Legislature, *Journal of the Seventy-first Senate of the State of New Jersey being the One Hundred and Thirty-ninth Session of the Legislature* (Trenton: MacCrellish and Quigley, 1915), 65, 213, 215, 277, 732, 804.

133. "Rockefeller Fund Wins. Jersey Governor Signs Bill for Foundation's Animal

Research," *New York Times*, 7 April 1915, 1.

134. "Medical Research With Animals," *The New York Times*, 8 April 1915, 12.

135. "Rockefeller Bill Signed by Fielder Animal Industry. Bureau May Now Be Established in New Jersey by Foundation," *Newark Evening News*, Wednesday, 7 April 1915, p. 10.

136. Corner, (n. 28) *Rockefeller Institute*, 132.

137. New Jersey Legislature, "An Act to amend an act entitled "An act for the prevention of cruelty to animals," approved March eleventh, one thousand eight hundred and eighty," *Acts of the One Hundred and Thirty-ninth Legislature of the State of New Jersey and Seventy-first Under the New Constitution*, Chapter 160 (Trenton: MacCrellish and Quigley, 1915), 317.

138. A carbon copy of a typescript from a handwritten memorandum by Simon Flexner on his visit with Governor Fielder on 16 June 1915, RAC, RU, RG 600-1, Legis. The memo was written on 12 July 1915 in Seal Harbor.

139. Carbon copy transcript (n. 138). In the Rockefeller Archive Center, (RU, RG 600-1, Legis.), there is a copy of a formally printed New Jersey legislature bill, Committee Substitute for Assembly No. 100, "An Act providing for the examination and inspection of institutions conducting scientific experiments or investigations on living animals in this State." It is undated and does not have the name(s) of the person(s) promoting it. The bill's summary statement, however, indicates this proposal came after Bill 108 was signed into law: it would have provided that "institutions engaged in such experiments [that is scientific experiments on living animals] are afforded unrestricted opportunities to inflict needless and unnecessary cruelty upon animals without detection, and this bill is intended through its provisions for inspection to protect living animals from needless suffering." The outcome of this proposal is not known to this writer but it clearly suggests the RIMR continued to have opposition to its work.

140. Carbon copy transcript (n. 138).

141. "Quarterly Meeting," 17 April 1915, MBSD, 1911-1917, 120. Jerome D. Greene served as the buyer for the property, the Gray and Strickler farms. The indenture between Greene and his wife (May T. Greene) and the RIMR is dated 8 June 1915. (RU, RG 417.1, UH CP, 1904-1959, box 1, folder 14, UH, CP, Princeton Dept. Animal Pathology). Jerome Greene

was an administrator and business manager for Flexner from 1910-1912 and became a member of Junior's personal staff, banker, and RIMR Trustee. Corner, (n. 28) *Rockefeller Institute*, 72.

142. Corner, (n. 28) *Rockefeller Institute*, 134, 284. This permitted Theobald Smith to continue work on histomoniasis, a serious protozoan disease of domestic turkeys, which he had begun at Harvard. Another researcher was Rudolph Werner Marchand, an entomologist from Leipzig, Germany, who investigated New Jersey deer flies, the females of which are blood suckers and vectors of disease. Corner, (n. 28) *Rockefeller Institute*, 133.

143. Corner, (n. 28) *Rockefeller Institute*, 133. The complete property extended on both sides of what was then Route 26 near Route 571 in the region of Penns Neck. The Route 26 designation was dropped in 1953 when the whole highway became Route 1. "Princeton" served, perhaps, as a more prestigious mailing address than "Penns Neck" for an institution such as the RIMR. See a map in *Collection Corporation/Theobald Smith*, RG 199.82(2), box 2, folder Correspondence. Also, personal communication from the New Jersey Department of Transportation.

144. Corner, (n. 28) *Rockefeller Institute*, 314. During the time Carl TenBroeck (M.D., Harvard University, 1913) was a medical student, he was a research assistant to Theobald Smith. After receiving his degree, he became a member of Smith's department at Harvard and continued working with him in Princeton. As a microbiologist, TenBroeck made various discoveries, particularly that the viral agent of Eastern equine encephalitis, whose distribution includes New Jersey, multiplies in the mosquito. One of those vectors is *Aedes sollicitans*, New Jersey' s infamous salt marsh mosquito. Corner, (n. 28) *Rockefeller Institute*, 311-13.

145. Corner, (n. 28) *Rockefeller Institute*, 175, 454. John Howard Northrup and Wendell Meredith Stanley were co-winners of one-half of the 1946 Nobel Prize for Chemistry for their work on the purification and isolation of enzymes and viruses; James Batcheller Sumner of Cornell University, Ithaca, NY, was awarded the other half for crystallization of enzymes. "The Nobel Prize Internet Archive," http://almaz.com/nobel/alpha.html, 29 October 2007. Major accomplishments of the Institute, both in New York and in New Jersey, in 100 years from its founding, are presented in text and photographs in Hanson, (n. 21) *Rockefeller Achievements*, 7-140.

146. Corner, (n. 28) *Rockefeller Institute*, 454. See also ""Rockefeller Land Coming Up For Sale 800-Acre Jersey Research Tract to be Disposed Of—Work Transferred to City," *The New York Times*, 22 July 1950, p. 13. Upon learning that the Princeton division would be closing, administrators of Rutgers University prepared a document requesting "consideration by the Institute of the possibility of making this property available for the principal use of the agricultural units of the University..." It is of particular interest here to note that, in arguing for the property and facilities, in the section titled "Animal Science" (page 12), Rutgers stressed that "New Jersey has an important animal industry which is confronted with disease problems fully as serious as they are in those states which are fortunate enough to have a veterinary school or at least a department devoted to animal pathology." Rutgers University, "Proposal to the Rockefeller Institute for Medical Research by Rutgers University," typescript carbon copy, 20 pages, unsigned but dated March 10, 1948. Rutgers University Special Collections, New Jersey Agricultural Experiment Station, Records, 1889-1962, Series III: Research Notes, Box 3, Folder 17. "Dean Martin" (probably William Hope Martin, Dean of the College of Agriculture) sent "a study" to Lindsley F. Kimball (Board of Trustees member) who forwarded it to then director of the Institute, Herbert S. Gasser, with comments including the information that Columbia University and the U.S. Navy were also interested in the property. See the letter from Lindsley F. Kimball to Herbert S. Gasser, dated 11 March 1948, RU, RG 302.4, Gasser, box 1, folder 14, Princeton Sales. What Dean Martin sent has not been found. Negotiations with Rutgers stopped because of State financial and political matters; sale discussions were also held with the U.S. Army and the National Lead Company. See Lindsley F. Kimball to John D. Rockefeller, Jr., dated 21 April 1949, RF, RG 2, Office of Messrs Rockefeller, Rockefeller Boards, Rockefeller Institute, Box 48, Folder 480, Sale of Princeton Property, 1947-1952. A reply to Kimball has not been located.

147. Corner, (n. 28) *Rockefeller Institute*, 457-8. The property was sold in 1951 and the Princeton Forrestal Center was built there. To the credit of the Value Group developers, what had been the home (""Larkfields"") of Theobald Smith and his family and, in 1931, became a club house for the Institute, was conserved and restored; it now serves as the Community Center for residents of the Princeton Landing homes (Princeton mailing address but in Plainsboro Township, Middlesex County). A photograph of the Smith House is shown in the Princeton

Landing web site, http://www.princetonlanding.org/page/RightFrame.html.

148. Hanson, *Rockefeller Achievements* (n. 21), 85.

149. Prior to the Seton Hall University College of Medicine and Dentistry (founded 6 August 1954), a viable and persistent medical school did not exist in New Jersey. The current state's medical schools and affiliated organizations evolved from that institution and became the University of Medicine and Dentistry of New Jersey on 10 December 1981 by an act of the legislature and signature of Governor Brendan Byrne. University of Medicine and Dentistry of New Jersey, "History," 14 June 2001, http://www.umdnj.edu/homeweb/university/history and Cowen, (n. 114) *Medicine and Health in New Jersey*, 137-40.

150. PSE&G, "Industry Profile: Pharmaceuticals," 29 October 2007.

151. PSE&G, "Industry Profile: Biotechnology," 29 October 2007.

152. After a series of amendments, these laws, published in the *New Jersey Permanent Statutes* under "Title 4, Agriculture and Domestic Animals, 4:22-16 Permitted Activities," now state "Nothing contained in this article shall be construed to prohibit or interfere with: a. Properly conducted scientific experiments performed under the authority of the Department of Health and Senior Services or the United States Department of Agriculture. Those departments may authorize the conduct of such experiments or investigations by agricultural stations and schools maintained by the State or federal government, or by medical societies, universities, colleges and institutions incorporated or authorized to do business in this State and having among their corporate purposes investigation into the causes, nature, prevention and cure of diseases in men and animals; and may for cause revoke such authority." http://www.njleg.state.nj.us, follow with clicking on Statutes; Title 4, Agriculture and Domestic Animals; 4:22-16 Permitted Activities. 28 October 2007.

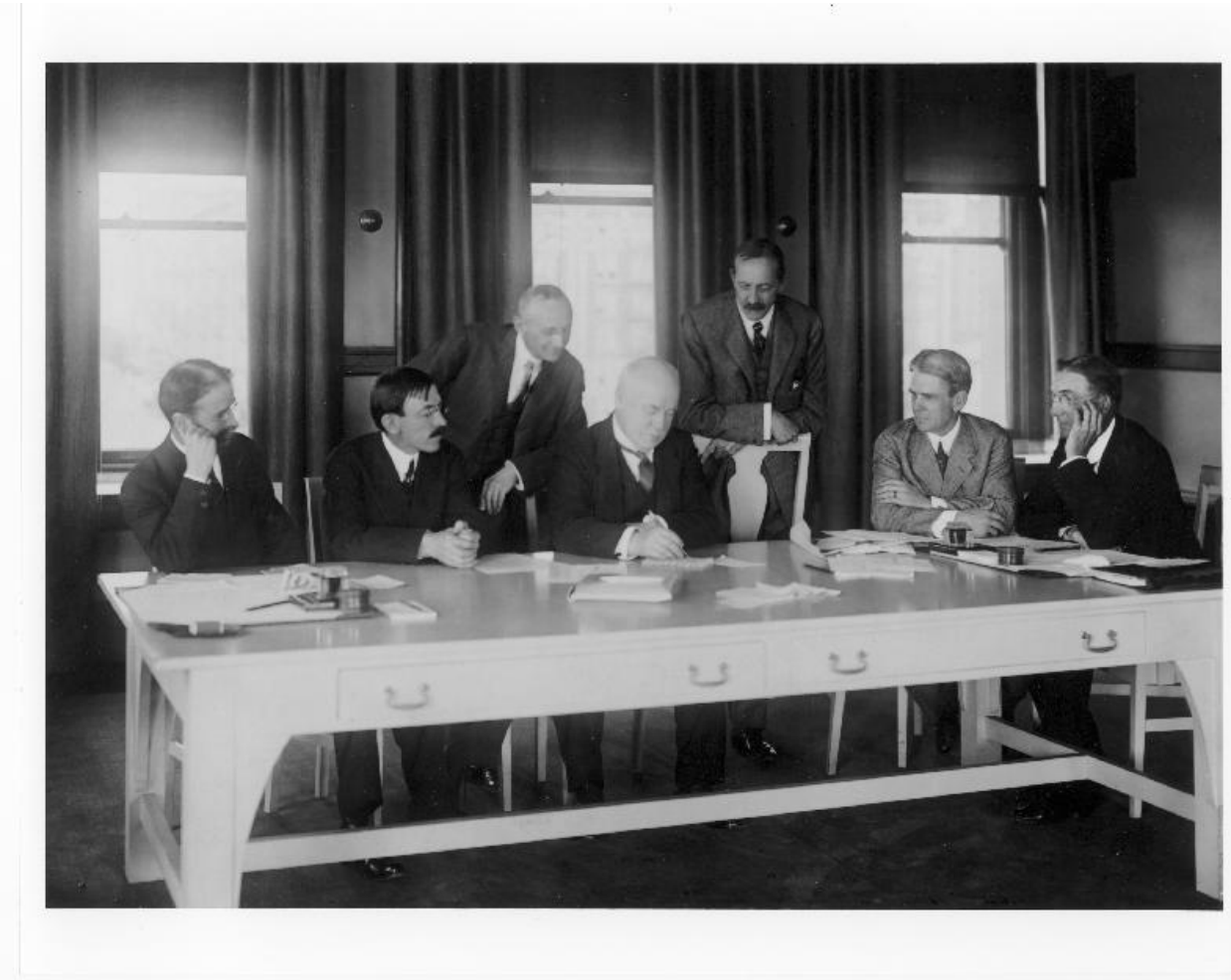

Figure 1. Rockefeller Institute for Medical Research First Board of Directors. Left to right: Theobald Smith, Hermann Michael Biggs, Simon Flexner, William Henry Welch, Theophil Mitchell Prudden, Luther Emmett Holt, Christian Archibald Herter. Photograph may have been taken in May, 1909. Courtesy of the Rockefeller Archive Center.

Figure 2. Aerial view of the Rockefeller Institute for Medical Research Princeton Campus. Concentration of buildings, left to right: power plant, animal pathology, plant pathology. Photograph taken about 1942. Courtesy of the Rockefeller Archive Center.